REVISIONAL NOTES ON AFRICAN *CHARAXES* (LEPIDOPTERA : NYMPHALIDAE) PART II

BY

V. G. L. VAN SOMEREN

The Sanctuary, Ngong, Kenya

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SYNOPSIS

One complex and the subspeciation in two species of the genus *Charaxes* are dealt with in which eight new subspecies and one new form are described and one name elevated to its original status and one new combination given.

1 THE *CHARAXES XIPHARES* COMPLEX

UP to the time of publication of the *Charaxes* section by Aurivillius, in " Seitz ", African Rhopalocera 1911, only one race of *Charaxes xiphares* (Cramer) was recognized, the name *thyestes* Stoll, 1790, being placed as a synonym. Thereafter, several races were described, notably by Rothschild, Jordan, Poulton, Carpenter and van Son.

After the lengthy description of *xiphares vumbui* by van Son (1936 : 201), Carpenter in the same paper lists the various races of the species, arranging them geographically. He retains the name *reducta* Rothschild for the race inhabiting " Caffraria " . . . Natal to Knysna, and the name *elatias* Jordan, for the race occupying the forests of West Pondoland, Natal and Zululand. By so doing he accepts *thyestes* Stoll as being a synonym of the nominate *xiphares* which has a range from Knysna to " west South Africa ".

Carpenter states "there is no record of *xiphares* from Nyasaland" unless *brevicaudatus* Schultze from Manow is placed to *xiphares*. Manow, however, is not in Nyasaland, but north of Lake Nyasa in Tanganyika Territory, between Rungwe and Poroto Mts. Carpenter placed *maudei* Joicey & Talbot to *xiphares*, following the same allocation proposed by Joicey & Talbot (1922 : 337). He also accepts Poulton's suggestion that *nandina* Rothschild & Jordan is a race of *xiphares*.

MAP 1. Sketch map of Southern, East and Central Africa, showing distribution of *Charaxes xiphares* and subspecies.

Charaxes x. wernickei Joicey & Talbot, known only from a single female type, said to have come from Cameroons, is accepted without comment.

In 1937, Jordan sank his name *elatias* as a synonym of *reducta* Rothschild (1937 : 324), making no further comment.

Dr. van Son (1953) published a comprehensive review of the species. He limits the range of the nominate subspecies, including the form *occidentalis*, to Cape Province from Swellendam to Port Elizabeth. He revives the name *thyestes* Stoll for the race inhabiting " Eastern Cape Province " from Pondoland to Port St. Johns, placing *reducta* and *elatias* as synonyms. He thus upsets the range of *elatias* Jordan =*reducta* Rothschild, as given by Carpenter, which included Natal and Zululand, and pointed out that the race inhabiting Natal and Zululand was distinct from *thyestes*, and he named it *penningtoni*. The three Transvaal races remained unchanged (except for the description of " forms ") i.e. *draconis*, *kenwayi* and *bavenda;* the southern Rhodesian race, *vumbui* is upheld.

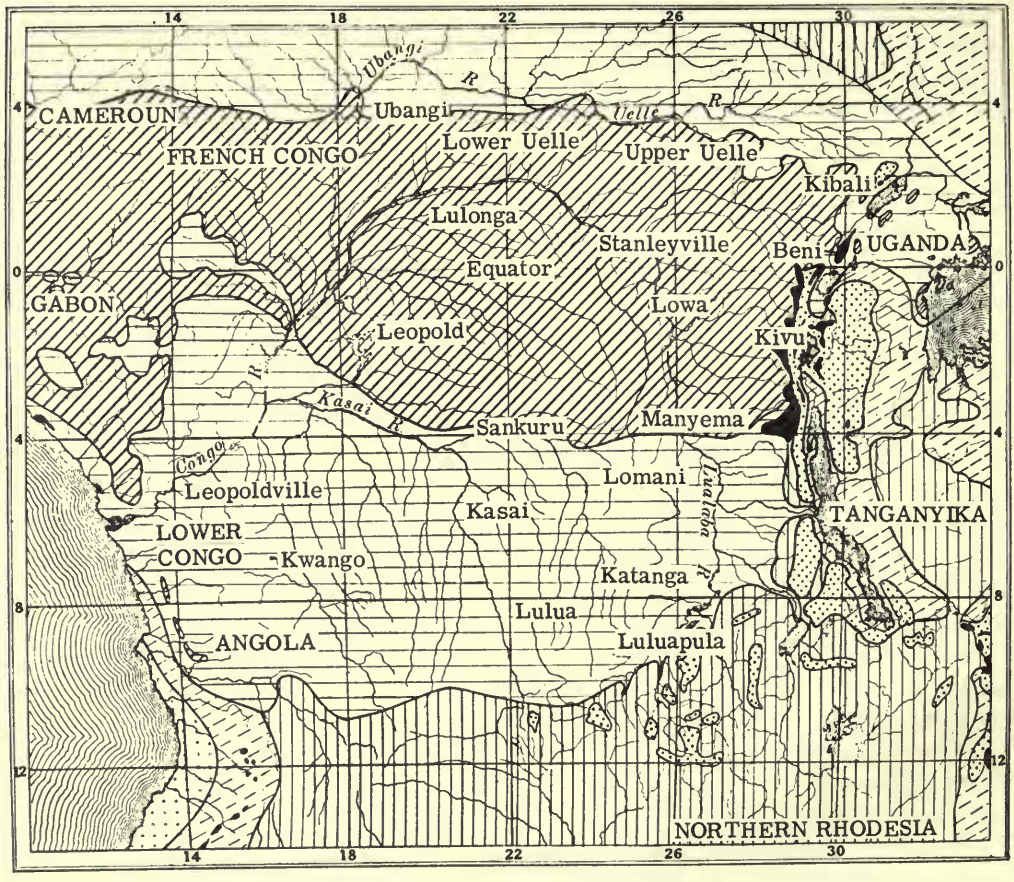
Having gone very carefully into the early published records of *xiphares* in South Africa, Dr. van Son then makes two very important points : that nominate *xiphares* was taken in the Cape Province west of Port Elizabeth, and that a form of it existed further west in the Swellendam district (f. *occidentalis* van Son), thus over-riding the opinion of Rothschild, 1929 : 481, that the name *reducta* Rothschild (syn. *elatias* Jordan) actually applied to an eastern race which had already been named *thyestes* by Stoll, the type of which came from " Caffaria " i.e. " east of Bruintjes Hoogte in the present Somerset East district ".

An examination of material from these areas seems to indicate that the characters on which the two are separated are not so well defined as is indicated in the descriptions, in fact, both races are somewhat variable in series, and might be united were it not for the fact that each has a variant peculiar to itself and that their areas of distribution are separated by a wide belt of dry karroid country unsuited to *xiphares*, thus ensuring reproductional isolation ; moreover, both Rothschild and Jordan, independently of each other, designated the eastern Cape Province insect by racial names . . . but the differences are slight.

Dr. van Son places *brevicaudatus* Schultze, as a race of *xiphares*, thus disassociating it from *cithaeron* of which it had been described as a variety. The type is a female (not male, as given by van Son). He then gives a reference to a male described by Rebel (1914 : 254), but apparently he did not study the original description very carefully, nor the figures, from which it is apparent that Rebel had before him two lots of males, four from N.W. Lake Tanganyika, one from Manow and one from Iringa. The latter two are true *brevicaudatus*, but the four from north west of Lake Tanganyika belong to another race, which van Son himself subsequently described as *burgessi*. Unfortunately, van Son repeats the error that Manow, the type locality of *brevicaudatus*, is in Nyasaland, whereas it is in Tanganyika.

He cites the male mentioned by Schultze as from Iringa, also three others from Tanganyika . . . " Rungwe Mts. and Morogoro-Korogwe Rd." but does not give a full description which might have clarified the composite one given by Rebel which was based on two races.

Dr. van Son excludes certain other " species " which had been placed to *xiphares*. Thus he discounts the suggestion made by Joicey & Talbot (1922 : 337) that *Charaxes maudei* Joicey & Talbot was another female of *brevicaudatus*, based on the evidence of a male (no locality given, other than Tanganyika) which they associated with their *maudei*, and which they said agreed with the figure of the male *brevicaudatus* given by Rebel (1914 : 254). Since we now know that the male of *maudei* is quite distinct, this is undoubtedly a male *brevicaudatus*.



Lowland Rain Forest | High grass savanna & Gallery Forest | Wooded savanna | Acacia & tall grass | Mountain grass land | Montane forest

MAP 2. Vegetational map of the Congo. (After Chapin.) Administrative districts indicated.

The type of *brevicaudatus* Schultze is a perfect female, now before me, and has very short tails, that of *maudei* has very long tails, and for this and other reasons van Son places *maudei* to the species *cithaeron* Felder, in spite of the fact that a race of *cithaeron* occurs in the same area but in a slightly different biotope. (For this same reason van Son gave it as his opinion (*in lit.*) that my recently described *Ch. kulal* (1962 : 45) also belonged to *cithaeron*.) Form and length of tail, in both male and female, are not of major significance in differentiating species, for there is some degree of variation in a given subspecies ; nevertheless, it is a morphological character of importance, often associated with environment. In the *xiphares* complex there are conspicuous features amongst its members which at first sight seem to suggest that the species can be divided into two main groups : A—those with very short thick tails in both sexes ; B—those with very long thin tails ; then again : a—those in which the females have a limited number of white spots in the fore wing discal bar, accompanied by an ochreous hind wing discal patch ; b—those in which the fore wing bar is more or less complete and the hind wing patch whitish, bluish-white to violet-blue. Similarly, in the male sex, whereas the southern races have the hind wing patch strongly blue and somewhat restricted, the discal blue becomes larger and more whitish-blue as the races range northward. Unfortunately, this tail-length character and colour division break down if we arrange the races in geographical sequence. Thus, although the races of the south, subject to continuous rainfall throughout the year, exhibit ochre-yellow discal patches in the hind wing of the females, those of the areas with summer or seasonal rain, tend to vary in the colour of the hind wing patch from ochre to whitish, often tinged with blue. This dichromatic variation seems to start in the Natal area and becomes more pronounced as the Transvaal is reached, then in Southern Rhodesia, the ochre phase is eliminated and the females are monochromatic, with a bluish-white to violet-blue hind wing patch and a complete fore wing discal white bar, that sometimes has an ochre-yellow tinge.

However, there would appear to be one exception to this general trend, for in the female of *nandina* Rothschild & Jordan, of the Kenya Highlands, the hind wing patch is always ochre, and in the male the hind wing discal patch is restricted but has an additional row of post-discal blue spots. This sudden reappearance of a type suggestive of the southern races of *xiphares* is disconcerting and one is forced to consider whether *nandina* is a *xiphares* retaining an ancestral character, or if it is a distinct species. My personal view is that *nandina* is a distinct species, and that the ochre patch in the hind wing of the female is not a recrudescence of an ancestral character ; moreover, I suggest that the more ancestral members of the " *xiphares* complex " are those within the northern range of its distribution and that the southern representatives have evolved the darker coloration due to climatic and other ecological factors. It is interesting to note that although hesitant about including *nandina* as a race of *xiphares* as was proposed by Poulton, Dr. van Son very reluctantly does so, but cites major, very obvious, differences between *nandina* and *xiphares*, in both sexes.

It must be noted that up to the time when van Son wrote his revision,

comparatively little material of the northern races existed, in some cases only a single specimen was on record, and not available for examination. The position has now greatly improved and with the acquisition of additional material and data, it seems necessary to re-orientate our views on the relationship of the various elements which go to make up this complex.

On the evidence provided by a consideration of the distribution and the gradual transition, in the main, of one type of coloration to another, and despite tail length, it is reasonable and compatible with evolutionary trends, to consider all members of this complex as belonging to one species *Ch. xiphares*, with one or possibly two exceptions, which are dealt with in detail hereafter.

With the ready co-operation of museums and individuals I have now brought together types or topotypes (and photographs of types) and much additional material, and now submit my views, using Dr. van Son's valuable paper as a basis for discussion.

Descriptions and Notes

Charaxes xiphares xiphares (Cramer)

(Pl. 1, figs. 1 and 2)

Papilio xiphares Cramer, 1781 : 171.

Male. Fore wing length 40–43 mm., outer margin rather strongly concave above vein 2 ; hind wing margin rather crenulate at veins. *Upperside*. Ground colour blue-black with strong blue sheen especially in basal area of fore wing, base of hind wing more brownish. Fore wing with two rows of blue spots, the inner discal row made up as follows : two spots just beyond cell, upper one small and linear, the lower one larger and more oval, followed by a larger more vertical spot sub-basal in 3, then a more elongate spot in 2, one or two smaller spots in 1b, then an elongate mark in 1a at hind margin ; a complete row of postdiscal spots, the two subapical ones white, the others blue, increasing slightly in size and reaching the large linear mark at hind angle ; margin with a series of small ochre internervular spots. Hind wing with a blue discal band stretching from costa to 1c where it merges into the grey-brown of the inner fold, widest at 4, inner edge almost straight, outer edge angled at 4 ; border blue-black with a complete row of submarginal blue spots, double at anal angle ; admargin with a series of blue and golden lunules ; tail at 4, 5 mm., lower tail shorter and slightly outward curved. *Underside*. Strongly variegated ; basal area of fore wing light olive-brownish distally and sharply defined by wavy black lines, white inwardly ; two black lines, outlined with white, cross the basal half of the cell ; the distal portion of the cell darker olive-brown, the apex of the cell defined by a black line, and just beyond the ground colour is lighter olive-brown. The disc of the wing is dark olive-brown to a distance corresponding to the postdiscal spots of above, but on this surface the spots are : two subapical spots white, rest golden ochreous ; within this dark area are lunate white marks, inwardly outlined in black crossing areas 1b, 2 and sub-basal in 3, the line in 3 shaded light olive-brown outwardly. Beyond the postdiscal line the wing is light olive-brown, slightly darker toward margin, with marginal internervular ochreous spots, most pronounced at the hind angle ; a large double black spot at the tornus surrounded by a pale purply ground colour in 1b, and in 2 above another more angular black mark. Hind wing ground colour in basal half olive-grey-brown, slightly darker distally and traversed by wavy black lines in cell and sub-basal in 6–7 ; discal area with an irregular zigzag whitish bar accentuated inwardly by a narrow black line but shaded distally with greyish-brown up to the row of lunate olive-ochreous postdiscal spots which are more or less margined in black ; the border of the wing lighter olive-brown with a complete series of whitish lunules outwardly shaded in violet, with double spot at anal angle ; admarginal lunules greeny-ochreous, more greenish at anal angle ; margin greyish to black along tails ; fringe white.

FEMALE. Fore wing length 50 mm. *Upperside.* Ground colour very dark brownish-black (tending to more brownish in old specimens) ; fore wing markings more or less as in the male but discal spots larger, spots beyond the cell end usually three in number, the sub-costal one narrow and linear, the next two more triangular, with base towards cell ; next spot set based in 3 more quadrate, that in 2 longer and angular and touching the post-discular series of which the two sub-apical ones are large and white, the remainder smaller and increasingly more ochreous and rather ill-defined, that on the hind margin more elongate ; marginal internervular spots absent except for the double one at the tornus. Hind wing with discal ochreous patch commencing as a single spot at about mid-costa, then increasing in width to 4 then narrowing and merging into the inner fold above the hind angle ; distal border with a series of small internervular violet-blue spots, double at anal angle ; admargin with golden-ochreous lunules from anal angle to 6; margin black ; tail on 4, about 7 mm., the lower tail shorter and outwardly curved. *Underside.* As in the male, but ground colour slightly more greyish-brown ; fore wing discal and post-discal marks whitish and more pronounced. Hind wing whitish discal bar broader and more pronounced and bordered by larger and stronger ochreous lunules ; admarginal lunate marks stronger.

♂ form ***occidentalis*** van Son

Charaxes xiphares ♂ f. *occidentalis* van Son, 1953 : 223.

MALE. *Upperside.* Very similar to the nominate form but differing chiefly in slightly smaller size and in the admarginal lunules of the hind wing being strongly blue ; underside more greyish.

FEMALE. *Upperside.* Pattern very similar to nominate race but spots in 1b prominent ; post-discal spots and marginal dots all present ; discal yellow suffusion in supramarginal area small. Hind wing, light discal area narrower, outer border very even. *Underside.* Ground colour both wings fuscous ; dark areas in disc of fore wing and internal to discal white line on hind wing darker and more in contrast. Hind wing black edging of discal streaks obsolete with intervening space between discal and post-discal streaks lighter and much wider in anal angle ; submarginal spots less prominent.

No specimens are available ; the description is based on that of van Son.

Range : The nominate race ranges from Knysna eastward to Port Elizabeth, and the form *occidentalis* from west of Knysna to Swellendam district. To quote Dr. van Son, " there are no geographical barriers sufficiently great to ensure reproductional isolation of *xiphares* from as far west as the forests of the Swellendam district to as far east as Van Stadens near Port Elizabeth ".

Charaxes xiphares thyestes (Stoll)

(Pl. 1, figs. 3–8)

Papilio thyestes Stoll, 1790 : 144.
Charaxes xiphares reducta Rothschild, 1929 : 481.
Charaxes xiphares elatias Jordan, 1963 : 331.

MALE. Fore wing length 42 mm. ; outer margin strongly concave at vein 4. *Upperside.* Ground colour black with dark blue sheen in certain lights. Fore wing with discal and post-discal blue spots as in the nominate race (as in type *elatias*) or spots in 2–5 absent or hardly visible (as in type *reducta*) ; marginal ochreous spots distinct. Hind wing discal blue area variable but usually larger than in nominate race, less straight on inner edge and irregularly indented on outer margin ; submarginal blue spots in black border well developed, and marginal lunules widely golden-ochreous ; margin dentate at end of veins ; upper tail robust, 5 mm., lower tail much shorter. *Underside.* Pattern as in the nominate race but less strongly

varigated, the discal light areas being suffused with more greyish-brown and in less contrast ; the admarginal black spots in hind wing rather more strongly marked whilst the dark lunate marks on outer edge of discal band also strongly marked. The tornal spots in fore wing more solid and the larger one only slightly indented on outer side ; black bars at base of fore wing usually thick.

Female. Fore wing length 50 mm. *Upperside.* Ground colour black to brownish-black; post-discal spots may be limited to two or three in the subapical area, the rest absent or faintly indicated ; the discal white spots rather smaller than in nominate race, that in 1a hardly visible. Hind wing ochreous discal area usually large, but rather variable ; spot below costa often whitish ; discal patch sometimes pale, but seldom whitish ; submarginal blue spots tend to be elongate ; admarginal golden-ochreous lunules well marked ; upper tail 7 mm., lower tail short 3–4 mm. almost straight. *Underside.* Colour and pattern as in nominate race, but often slightly darker, and pale areas less in contrast ; tornal dark spots in fore wing well developed, often carried up to 3 ; dark spots distal to the discal bar in hind wing well developed, especially in region of anal angle.

Range : " In all forests of the eastern Cape Province including Pondoland : Zourberg, Hogsback, Katberg, Somerset East, Pirie forest, Port St. Johns" (teste van Son). There is a wide area of dry karroid country between the habitats of the nominate race and *thyestes* which is an effective barrier between the two races.

Charaxes xiphares penningtoni van Son

(Pl. 2, figs. 9–14)

Charaxes xiphares penningtoni van Son, 1953 : 225.

This race has a considerable altitudinal range from about 1,000–4,000 ft. in the region of the National Park. There is thus some variation in size in both sexes, the larger and finer specimens coming from the higher altitudes as a rule, but the pattern and colour characters remain fairly constant. Males from Eshowe have fore wing lengths of 38–45 mm., females 41–48 mm., compared with males of 42–46 mm. and females 52–55 mm. from higher altitudes.

I propose to quote from the original descriptions of the two sexes.

Description of holotype ♂. Apex of fore wing and the angle of outer margin at end of vein Cu_2 more rounded than in the two foregoing subspecies, and tails of hind wing shorter, though longer than in following subspecies. *Upperside.* Fore wing discal spot M_2 distinctly longer than M_3 (being produced basad). Hind wing blue discal area broader and much more even than in either *x. xiphares, x. thyestes* or *x. draconis ;* its outer edge straight between *RS* and M_2 and also between M_2 and Cu_2 ; hairs between Cu_2 and anal fold much darker than in all other subspecies. Submarginal blue spots rounder than in other subspecies. Marginal lunules blue as in extreme western specimens of *xiphares* (in some paratypes they are more or less suffused with orange-yellow). *Underside.* General colour much darker than in other subspecies, especially the space between the median and discal streaks of both wings. *Length of forewing :* 45 mm. Antenna-wing ratio : 0·47.

Description of allotype ♀. *Upperside.* Discal spots below vein Cu_2 reduced to a minute white dot placed below outer edge of spot in Cu_2 (in some paratypes this dot is absent) ; marginal spots limited to area A_2. *Hind wing:* Light discal area much smaller than in other subspecies, its outer edge diffuse, but not crenulate ; it is suffused with black near its posterior angle along vein Cu_2 ; submarginal spots streak-like. Tails shorter and broader than in *x. thyestes. Underside. Fore wing :* Area between median streaks and white discal band and the space

between the latter and post-discal series strongly suffused with dark fuscous-black ; black portion of all transverse streaks very heavy. *Hind wing :* Ground colour very dark throughout, especially from base to as far as the discal band ; outer edging of post-discal lunules very much thickened and deep black. *Length of fore wing :* 51·5 mm. Antenna-wing ratio : 0·39 in.

The above description of the male applies to most examples from the higher areas, but in a long series before me, there is considerable variation not only in size and blue markings but in the length and thickness of the tails. Although the original description fits a majority of the typical female form, many specimens in a long series show variations in some respects. Thus in some specimens the fore wing post-discal series of spots is complete ; the spot below vein Cu_2 may be large ; the hind wing ochreous patch is often large, the outer edge defined and irregular ; in some specimens, the sub-marginal blue spots are large, or they may be hardly visible ; the tails may be short and thick, or longer and thinner. In some specimens the fore wing discal spots may be creamy or pale ochreous.

♀ form ***luminosa*** van Son

(Pl. 2, fig. 9)

Charaxes xiphares penningtoni ♀ f. *luminosa* van Son, 1953 : 226.

The chief character of this form is the white, instead of an ochreous, discal patch in the hind wing. The original description is as follows :

" Like the type form, from which it differs in the hind wing light area being white with a distinct lavender-blue gloss, irrorated along its outer edge with violet-blue scales ; and in the presence of yellow marginal spots in the fore wing, which are, however, very minute in areas Cu_2 and obsolete between M_2 and the apex. . . "

In the specimen before me, the hind wing submarginal blue spots are large and the marginal golden-ochreous lunules are well marked.

Range : This subspecies occurs in all the higher forests of the Natal district, but as already indicated, has a considerable altitudinal range. I have examined specimens from the National Park and Champagne Castle, Bulwer, Kloof, Dargle, Balgowan and Eshowe. There appears to be a break between this subspecies and *thyestes* to the south.

Charaxes xiphares draconis Jordan

(Pl. 2, figs. 15, 16 ; Pl. 3, figs. 17, 18)

Charaxes xiphares draconis Jordan, 1936 : 331. [♂, ♀]

Male. Fore wing length 40–45 mm. ; margin not strongly concave. *Upperside.* Fore wing discal blue spots variable in size but usually smaller than in *penningtoni ;* marginal golden-ochreous spots present in all areas largest in 1b ; post-discal spots small. Hind wing blue discal area rather narrow and tending to be divided by dark veins in upper half ; submarginal blue spots somewhat T-shaped with stalk directed distad ; marginal lunules rather separated by dark veins, margin thus dentate ; tails usually short and stout, 3 mm. long. *Underside.* Not strongly variegated and more uniformally olive-brownish, the zigzag whitish discal lines thin ; the tornal black spots set off by a strong bluish ground accentuated by golden borders ; margin strongly ochreous.

Female. Fore wing length 50–53 mm. *Upperside.* Fore wing with large discal white spots usually in two blocks ; three spots beyond cell end, two large spots in 3–4 followed by a small white dot in 2, and obscure ochreous spots in 1a–1b, that in 1a elongate along the hind margin ; post-discal spots, three upper ones white and large, remainder tending to be obscured and ochreous in colour ; margin with obscure ochreous spots, most apparent at the tornus. Hind wing with a large rather pale, less golden discal patch represented at the costa by one spot ; outer edge slightly irregular ; submarginal blue spots large, angular or T-shaped, stalked distad ; margin with golden-ochreous lunules tending to be separated by dark veins ; tails short, thick-set, upper one 5 mm. *Underside.* Very similar to the male, more uniformly brownish in ground colour, with dark and whitish lines not strongly marked, thus not at all variegated, but fore wing white bar distinct and may be wide to area 1b.

An interesting variation has the fore wing discal bar on upper side extended through areas 2 and 1b right to hind margin (*vide* Pl. 3, fig. 18).

♀ form ***candida*** van Son

Charaxes xiphares draconis ♀ f. *candida* van Son, 1953 : 226.

Differs from the typical female by having the hind wing discal patch on upper side slightly smaller, white in colour with slight violet sheen around, especially distally. Submarginal blue spots as in the typical form.

Range : Forests of the Transvaal Drakensberg Range *south* of the Olifants River to Barberton district.

Charaxes xiphares kenwayi Poulton

(Pl. 3, figs. 21, 22 ; Pl. 4, figs. 25–27)

Charaxes xiphares kenwayi Poulton, 1929 : 48. [♂, ♀]

Male. Fore wing length 40–43 mm. *Upperside.* Very like *draconis*, but averaging slightly smaller ; blue spots in fore wing somewhat variable but on the whole slightly larger than in *draconis* in both discal and post-discal series. Hind wing with the blue discal band tending to be strongly indented on the outer margin, and the upper portion divided by black veins ; submarginal blue spots tending to be larger than *draconis*, but rather variable ; tails usually short and robust. *Underside.* Markedly less variegated than southern races, more uniformly brownish-drab even than in *draconis*, relieved only by dark basal lines and blackish tornal spots.

Female. This is the form with a white discal band on the upperside of hind wing. Fore wing length 45–48 mm., usually small. Fore wing discal bar white, spots beyond cell usually well developed, spots in 4–5 large, spot in 1b very small ; there may or may not be an elongate mark on the hind-margin. Hind wing discal area white with slight violet tinge, rather variable in size but usually small and hardly extending beyond vein 2, sometimes clouded over by greyish or ochreous scales in 5–6 ; submarginal blue spots not well developed and marginal lunules rather diffuse and not well defined ; tails longer than in the male, but comparatively short, upper tail 6 mm. *Underside.* Ground colour more uniform drab-brown, the discal area only slightly darker ; pale areas strongly suffused with brownish in hind wing.

Although described as the typical form, it has been found that the form *lutea* van Son with ochreous hind wing discal patch is equally common or even commoner. Form *kenwayi* corresponds to the form *candida* of subspecies *draconis*, and the form *luminosa* in subspecies *penningtoni*.

♀ form ***lutea*** van Son

Charaxes xiphares kenwayi ♀ f. *lutea* van Son ; 1953 : 227.

Fore wing length 45–48 mm. Very similar to the female form *draconis* of *xiphares draconis* but usually much smaller. *Upperside.* Fore wing discal white bar well developed and often with distinct white spots in 2 and 1b ; post-discal series white in sub-apex, then less distinct and tinged with ochre in 3–5, or the spots may be absent in these areas ; marginal ochre spots well developed. Hind wing with the discal patch often larger than in form *kenwayi* and ochre in colour ; submarginal blue spots usually large and distinct, but may be small ; marginal ochre lunules narrow but well marked and divided by ends of dark veins ; tails short and robust, 5–6 mm. long at 4. *Underside.* As in form *kenwayi*, but pale areas in hind wing larger but equally suffused with brownish ; discal fore wing bar more pronounced and often more extended into areas 1b and 2 ; marginal lunules strong.

A variation of this form has the fore wing discal spots above, creamy or even pale ochreous ; the post-discal spots ochreous.

Range : In the forests of the Wolkberg Range, Woodbush, Haenertsberg and Pietersberg to the *north* of the Olifant River.

Charaxes xiphares bavenda van Son

(Pl. 3, figs. 19, 20, 23, 24)

Charaxes xiphares bavenda van Son, 1935 : 487. [♂, ♀]

A small race.

Male. Fore wing length 44 mm. *Upperside.* With well marked large spots in discal bar which are a brighter blue than in *kenwayi* and are extended through area 2 and 1b to the elongate spot on the hind margin ; post-discal bar may be complete or broken in mid area, two subapical spots white or bluish white, remainder often only just visible but obvious in area 1b. Hind wing blue discal area rather narrow and with distinct whitish area proximad and toward area 2, and thus shows a slight resemblance to male of *vumbui* which is considerably larger. Submarginal blue spots large and distinct ; marginal lunules golden but with a suffusion of black scaling and rather narrow ; tails short but comparatively thin, upper tail 3–4 mm. *Underside.* Not strongly variegated and ground colour generally more greyish-brown, only a slight darkening in discal area of fore wing; basal area crossed by black lines. Hind wing discal zigzag white line very thin ; margin of fore wing only slightly ochreous tinged ; tornal black marks well developed.

Female. Fore wing length 47–48 mm. *Upperside.* Discal spots large and white, the three marks beyond end of cell of about equal length forming a rectangular block, set at an angle to large triangular spot in 3 ; spot in 2 more elongate, two small white spots in 1b, elongate mark on hind margin tinged ochreous. Hind wing discal patch comparatively narrow, white at costa and borders especially distal and along inner margin densely greyish or ochre scaled ; submarginal blue spots small but distinct ; margin of wing dentate, lunules narrow, tails rather short and stout, upper tail 5 mm. lower slightly shorter.

♀ form ***ochreomacula*** van Son

Charaxes xiphares bavenda ♀ f. *ochreomacula* van Son, 1935 : 489.

This form has not been examined by me but the main character seems to be that the fore wing discal spots on upperside are tinged with ochreous.

♀ form ***cyanescens*** van Son

(Pl. 3, fig. 24)

Charaxes xiphares bavenda ♀ f. *cyanescens* van Son, 1935 : 489.

This form agrees with the form *bavenda* on the upperside in respect to the fore wing spots, but the hind wing discal patch is white suffused marginally with lavender. The submarginal blue spots are more distinct and elongate ; the tails are longer, the upper one with a white streak on lower border, the lower one with the white streak on upper border ; margin bluntly dentate. This form approaches form *kenwayi* of subspecies *kenwayi* and forms a bridge towards female *vumbui*, of Southern Rhodesia.

Range : Occurs in the Entabeni area of the Zoutpansberg district of Northern Transvaal, in forest country.

Charaxes xiphares vumbui van Son

(Pl. 4, figs. 29–32)

Charaxes xiphares vumbui van Son, 1936 : 20.

Male. Fore wing length 40–44 mm. *Upperside.* ground colour strongly blue-black, with a marked sheen, slightly greenish toward the bases of the wings. Fore wing discal blue spots well developed and extending to the hind margin where the spot in 1a is elongate, the spot in 1b more triangular, small in 2; post-discal series complete, white in the subapex then blue in 2, all well developed ; marginal golden ochreous spots small but distinct. Hind wing discal blue area large, with white sheen on posterior and inner areas, widest at 2 just below cell ; outer border indented by black veins ; represented at subcosta by one blue spot ; black border with complete series of rounded or T-shaped blue spots, double at anal angle ; margin with golden lunules well developed but separated by black vein ends ; tails short, upper 3–4 mm. lower, 2·5 mm. *Underside.* Ground colour olive-grey-brown. Fore wing discal area only slightly darker, and bordered by a zigzag black line outwardly accentuated with white and broadly shaded with ochreous distally ; post-discal olive-ochre line of lunules well marked, the subapical ones white as above ; tornal black spots well developed, strongly indented on outer edge ; black lines in basal area of wing distinct ; margin with obscure ochre-olive spots. Hind wing basal area with S-shaped olive-ochre mark outlined in black ; discal zigzag black and white line narrow extending from costa to anal angle, followed by ochreous-olive lunules, separate or contiguous in mid area from costa to anal angle, followed by a submarginal row of lilac spots outwardly dark ; margin with interrupted golden spots.

Female. Fore wing length 46–51 mm. *Upperside.* Ground colour brown-black with slight purply sheen ; fore wing with strongly developed white discal bar ; three elongate spots beyond cell-end with bases square cut, spot in 4 set out at about mid-point of one above, followed by an elongate spot 3, a long oval one in 2 followed by elongate marks in 1a and 1b which may be violet tinged ; post-discal series complete, two upper subapical spots white, remainder slightly or strongly ochreous to orange, double spot at tornus ; marginal internervular spots small or hardly indicated. Some specimens have a white subcostal spot in cell. Hind wing with a large whitish discal patch, irregular in outline internally, and outwardly with strong violet suffusion extending to posterior end ; a large whitish spot at upper end of subcosta ; submarginal series of violet-blue triangular or T-shaped spots complete and double at anal angle ; margin with strongly developed golden-ochre lunules separated by dark veins, greenish at anal angle ; inner fold greyish to grey-brown. *Underside.* As in the male but fore wing white bar of above strongly represented but slightly reduced in width at hind margin. Hind wing as in the male but with a well marked white bar corresponding to the inner portion of the discal patch above ; other marks as in the male but enlarged.

Variation. A not uncommon variety of female has the large marks of the fore wing bar above, cream or ochreous. It will be recalled that similar varieties occur in subspecies *kenwayi*, *penningtoni*, *bavenda*.

Range : Occurs in the high eastern areas of Southern Rhodesia on the Vumba Mountains from Umtali to the Chirinda Forest.

This subspecies of *xiphares* is an advanced development of *bavenda* toward the more northern races and bears a strong resemblance to *Charaxes cithaeron* on the upperside.

Charaxes xiphares woodi ssp. n.

(Pl. 5, figs. 35, 36)

MALE. Fore wing length 46–47 mm. (thus larger than *vumbui* or *brevicaudatus*). *Upperside.* Ground colour blue-black but with a purply sheen distad and a greeny sheen basad. Fore wing blue discal bar not very strongly developed, the spots are relatively small : two spots beyond the cell, one sub-basal in 4, one about mid-point in 3 followed by one each in 1b and 2, with an elongate spot on hind margin in 1a ; post-discal series of spots complete but not strongly marked except the two subapical white ones ; margin with well marked ochreous spots. Hind wing discal band blue with white scaling posteriorly, fairly straight on inner border, more irregular on outer ; spot at costa large ; submarginal series of blue spots large, somewhat triangular ; margin broadly golden-ochre narrowly interrupted by black veins. *Underside.* Lighter and browner than *vumbui*, but markings very similar ; tornal spots distinct ; and margin strongly orange-ochreous in hind wing ; marginal spots in fore wing comparatively large and distinct.

FEMALE. At present unknown.

Holotype male. NYASALAND : Cholo, iv.1928 (*R. Wood*). (British Museum (N.H.).)

Paratype. NYASALAND : Limbe, x.1946 (*J. D. Handman*). (National Museum, Bulawayo.)

Range : This subspecies seems to be very scarce and occurs only in the southern area of Nyasaland, so far as is known, and has been taken at Cholo by the late Rodney Wood in April 1928 and by J. D. Handman at Souche, Mt. Limbe, in October 1946.

It must be noted that *woodi* is separated from the eastern Rhodesian race *vumbui* by the wide low Zambesi Valley. It is most important to ascertain its northern range and how close it comes to ssp. *brevicaudatus* of Tanganyika Territory just north of Lake Nyasa, and the Nyika Plateau N.W. of Lake Nyasa.

Charaxes xiphares brevicaudatus Schultze

(Pl. 5, figs. 33, 34, 37, 38)

Charaxes cithaeron var. *brevicaudatus* Schultze, 1914 : 3 [♀].
Charaxes cithaeron var. *brevicaudatus* Schultze ; Rebel, 1914 : 254 [♂, in part].
Charaxes ludovici Rousseau-Decelle, 1933 : 271 [Original description and photos of type examined].

The female type was originally described as a variety of *Ch. cithaeron* by Schultze. Subsequently, Rebel (1914 : 254) described what he took to be the male and gave two figures. Unfortunately, Rebel had before him two lots of males, four specimens

from the Rugege Forest, N.W. of Lake Tanganyika (Grauer coll.), two specimens from Tanganyika Territory, from Manow and Iringa. These male specimens represent two distinct subspecies, the ones from Manow and Iringa are males of *brevicaudatus*, the others, males of *xiphares burgessi* van Son.

I have before me the type of *brevicaudatus* Schultze (kindly loaned by the Berlin Museum). I also have two of Grauer's specimens, and the photograph of the male figured by Rebel, who apparently did not designate a type ; the figure however is that of *burgessi*. I am informed that the Manow and Iringa specimens were in the collections of Jaennée and Neustetter respectively, but they cannot be traced. However, I have before me a male from Manow and one from Iringa (loaned by the British Museum (N.H.), *ex* Joicey Bequest and *ex* Levick Bequest) and others from intervening localities.

Male. Fore wing length 45–47 mm. *Upperside.* Ground colour blue-black with greenish sheen towards base of fore wing ; fore wing outer margin only slightly or hardly at all concave at 4 ; discal blue spots in 2 beyond the cell end, and two below in 4–3 large, spot in 2 very small, that in 1b larger and more elongate ; long blue streak on hind margin ; post-discal spots with two prominent white subapically, remainder small and blue ; margin with small punctiform ochreous spots, larger at tornus. Hind wing discal light area blue with whitish scaling at inner and posterior borders, inner edge fairly even, outer margin indented at veins, represented at subcosta by one or two blue spots ; submarginal blue spots small or punctiform ; marginal lunules narrow and ochreous ; tails very short, somewhat variable, 2–4 mm. at 4, lower tail 2–4 mm. *Underside.* Drab greyish-brown very similar to *woodi* ; markings similar but black discal lines rather stronger and with more violet shading distad. Hind wing with discal line stronger, and intermediate ochre-olive lunules more defined ; admarginal spots clearer but marginal ochre spots and lunules narrower.

Female. Fore wing length 52 mm. *Upperside.* Ground colour brown-black with purply sheen. Fore wing discal band complete ; costa whitish just above first of three elongate white marks beyond end of cell, the middle spot longer and elongate projecting beyond third spot proximal and distad, spot in 4 bluntly arrow-head shape indented on distal side and set out from about the mid-point of spot above, spot in 3 a long oval, that in 2 elongate, about half the length of one above, spot in 1b more quadrate but with outer side inclined, spot 1a on hind margin more elongate and diffuse due to purply scaling overall ; spots in middle of bar well separated ; post-discal series of spots complete, subapical ones large and white, remainder suffused with ochre ; marginal ochre spots small, and double at tornus. Fore wing bar is narrower than in *vumbui* and the post-discal series more apparent. Hind wing discal pale patch larger than in *vumbui* and whiter, with less violet dusting on sides, irregular on inner border and angled on outer side, by area in cell extending distad, the lower end merging into the greyish of the inner fold ; submarginal series of violet-blue internervular spots triangular or T-shaped, double at anal angle ; marginal golden-ochre lunules slightly greenish at anal angle well marked and only slightly divided by end of black veins ; tails longer than in *vumbui*, upper 5·5 mm, lower 5 mm. *Underside.* Generally similar to the male, but ground colour paler and lighter than in *vumbui*, but with discal white bar of above strongly represented and with the lower spots ringed with violet ; post-discal spots clearer than above, tornal black spots accentuated inwardly with olive-ochre and very well marked ; marginal ochre spots rather diffuse except those of tornus which are large and clear. Hind wing with fine black lines in upper half of basal area ; discal bar whitish and well marked in upper half and fading out on inner fold ; intermediate olive-ochre spots subdued ; submarginal violet-grey lunules clear but not strong, ending in double dark spot at anal angle ; marginal lunules well developed.

Range : Originally described from Manow in S.W. Tanganyika Territory just north of Lake Nyasa, this subspecies has now been recorded from the Poroto and

Rungwe Mts., and eastwards to Iringa, and between Morogora and Korogwe ? Turiani. Though several males have been taken, the type female remains unique. This race has recently been taken on the Nyika Plateau, Nyasaland.

Records of this subspecies from further north-west, especially from north-west of Lake Tanganyika (Rebel) are erroneous.

Charaxes xiphares burgessi van Son

(Pl. 4, fig. 28 ; Pl. 5, fig. 38 ; Pl. 6, figs. 40, 41)

Charaxes cithaeron brevicaudatus Schultze ; Rebel, 1914: 254, pl. 20, figs. 21, 22 [♂ in part].
Charaxes xiphares burgessi van Son, 1953 : 229.

Male. Fore wing length 45–48 mm. *Upperside.* Fore wing strongly blue-black with greenish sheen at base ; blue spots well developed in discal bar, and of a bright hue, two spots beyond cell elongate, those of 3–4 larger and more quadrate, a small spot in 2 followed by elongate marks in 1a–1b, especially long in 1a and often in contact with blue spot of post-discal series in this area ; post-discal spots with two subapical rather large and white, followed by a complete series of blue spots, usually small, but well marked, though occasionally those of 3–4 may be vestigial ; marginal border with distinct golden internervular spots. Hind wing, discal patch bright blue with white scaling on inner-posterior aspect, slightly irregular on inner border and more so on outer, carried up to subcosta as two fused, or more rarely, two separate spots ; black border with well developed blue spots rather triangular in shape, double at anal angle ; marginal golden-ochre lunules well developed and separated by black veins ; tails short and robust, upper 4–5 mm., lower only slightly shorter, 3–4 mm.

Underside. Rather darker than *brevicaudatus*, mid-zone distinctly darker and crossed by paler irregular discal band ; post-discal olive-ochre lunules well marked ; the spots in sub-apex white or whitish ; tornal marks well developed with strong violet-grey surround on outer aspect ; marginal ochreous spots strong.

Female. Fore wing length 50–52 mm. *Upperside.* Ground colour brown-black with a purply sheen ; fore wing discal spots, including costa above white in upper section to vein 3, lower spots increasingly suffused with yellow ochre. the two hind-margin spots fused or only just separated distally ; post-discal spots well developed, upper two large and slightly whitish inwardly, the remainder strongly orange-ochre ; marginal ochre spots large at tornus and small in other areas to apex. Hind wing discal band rather narrow, whitish inwardly with strong lavender suffusion mostly on outer side, inner border irregular, outer more so and accentuated with golden-ochre scaling on the dentate projections ; inner fold dark ashy-grey along 1c then paler to inner side ; black border with well defined lilac blue spots, double at anal angle ; margin with broad orange-ochre lunules separated by black veins ; tails, upper 7 mm., lower 5 mm. with slight outward curve. *Underside.* As in the male but paler, more greyish but the more pronounced markings are larger. Fore wing white discal band marked to as far as 1b, then represented by more greyish marks ; post-discal spots clear ; tornal black marks well developed ; marginal ochreous spots present and most marked above tornus. Hind wing ground colour and pattern as in the male, but the discal pale bar most marked and whitish in 6–7 ; ochre lunules well defined.

Range : Originally described from the Ruhiza and Mafuga forests of Kigezi in S.W. Uganda, 7,000–8,000 ft., this subspecies of *xiphares* is now known to occur in the Ruanda-Urundi country and the forests of Rugege, North West of Lake Tanganyika.

Charaxes xiphares ? ssp.

(Pl. 6, figs. 42, 45)

I have recently received from Dr. Berger, a single male specimen of *xiphares* taken by Madame Mortiers on the upper Lalule River (trib. Lualaba River, Katanga) 3,150 ft., *ex* Coll. Overlaet. No race of *xiphares* has been recorded from the Congo, other than examples of *xiphares burgessi* van Son, from the Rugege Forest, N.W. of Lake Tanganyika.

The specimen agrees somewhat with *burgessi* in that the blue discal spots of the fore wing are large, but unlike that race, the spot in 2 is large and not reduced to a dot, so that the band appears more continuous. The two subapical post-discal spots are large and slightly scaled with ochreous distally, as in some specimens of *burgessi ;* the rest of the series are blue. The hind wing discal patch is wider than in *burgessi*, especially in 3–5, and is carried up to the costa, where the spot is slightly whitish, otherwise it is mostly blue, but with white scaling in the disc ; the submarginal series of blue spots are distinct, except at upper angle, and the marginal golden lunules are well marked in the lower two-thirds, but divided by ends of black veins ; the tails are moderately slender, longer than in *burgessi*, the upper being 5 mm., the lower 4 mm. and are mostly golden with black borders.

The underside has the ground colour paler, more brownish than in *burgessi*, with the black marks very similar, but with the olive-ochre and pale lilac shading less distinct.

This male specimen bears a strong resemblance to a subspecies of *Ch. cithaeron* which occurs in the bend of the Kafue River, Northern Rhodesia, in patches of gallery forest. The female is unknown.

Range : Known only from the Kalule area, Katanga.

Charaxes xiphares maudei Joicey & Talbot

(Pl. 5, fig. 39 ; Pl. 6, figs. 43, 44 ; Pl. 7, figs. 46, 47)

Charaxes maudei Joicey & Talbot, 1917 : 271 [♀].
Charaxes xiphares brevicaudatus Schultze ; Joicey & Talbot, 1922 : 337.

Described as a species, the female was subsequently placed to *brevicaudatus* Schultze by Joicey & Talbot, and the suggestion made that this might be allied to *xiphares*. They state that they had acquired a male from Tanganyika Territory (no exact locality mentioned) which they assumed to be that of *maudei*, and, as it appeared to agree with Rebel's figure of male *brevicaudatus*, they sank *maudei* to *brevicaudatus*. Rebel had two forms of males before him when he described what he took to be male *brevicaudatus* ; (1) four males of *burgessi* van Son from N.W. Lake Tanganyika (*Grauer*), one of which he figured, (2) a male from Manow and one from Iringa in Tanganyika which are true male *brevicaudatus* and are very similar to *burgessi* but can be distinguished easily.

I have seen the male specimen that Joicey & Talbot received which belongs not to *maudei* but to *brevicaudatus*.

Dr. van Son (1953 : 221–222), discounts Joicey & Talbot's suggestion that *maudei* and *brevicaudatus* are the same, but he admits the latter to *xiphares*.

I now have before me five males taken in association with four females which agree with the type of *maudei*. They were however captured in the upper forests of the Usambara Range, near Loshoto, by two different collectors. Although this locality is far removed from " Lindi " said to be the type locality of *maudei*, and since this locality is suspect, and the new material agrees with the type, I consider them to be *maudei*, the male of which has not been described.

MALE. Fore wing length 48–50 mm. (thus a large race). *Upperside*. Ground colour a deep blue-black, deeper than *burgessi*, with a slight greenish sheen at base of fore wing ; discal blue spots rather smaller than *burgessi* or *brevicaudatus*, with or without a spot in 2, or only slightly indicated, large spot in 1b usually present, that on hind margin at 1a a long streak ; post-discal spots in complete series, two sub-apical ones white, remainder blue, that in 1b tending to fuse with discal mark ; marginal golden-ochre spots well defined. Hind wing with large discal patch, whitish proximad and strongly blue distad, inner border merging into the greyish of the inner fold ; this patch is narrow in area 5, then there is a break followed by a detached whitish spot at sub-costa, with sometimes a very small spot distad. The black border, widest in 6–7 and tapering rapidly to the anal angle carries a series of small blue spots to area 6 ; wing margin with narrow golden-ochre lunules separated by black veins, tails, upper long and thin 9 mm., lower 6 mm., with a decided intermediate " tail "; in fact the margin of the wing is widely serrate with extreme edge black. *Underside*. Very similar to *burgessi* but of a slightly colder grey tone, with markings essentially the same, though in the hind wing the discal zigzag line is stronger ; the marginal lunules are a deeper orange and better marked.

FEMALE. Fore wing length 48–52 mm. *Upperside*. Ground colour brownish-black with purply sheen, more brownish olive at base of wings. Fore wing with well developed discal white bar which includes the costa above the three elongate marks beyond cell end, the middle one projecting beyond the other distad, median marks large, spot in 4 bluntly triangular with or without a slight indentation on distal end, spot in 3 a long ovoid or with flattened outer side, spots in 2 and 1b long ovoid set at an angle to each other, the latter merging into a bluish-lilac area contiguous with and extending into 1a at the hind-angle ; post-discal spots clear and well developed, ovoid in shape and orange-ochre in colour, two lower ones contiguous with or just slightly separated from white spots in 1b–2 ; subapical spots whitish proximally ; margin with large tornal double spot, others above less conspicuous but extending to near apex. Hind wing with large whitish discal patch with varying amount of bluish-lilac scaling on both inner and outer borders, the posterior end merging gradually into the greyish inner fold which is often dark in 1c ; the upper part of the patch extended up towards the costa by a large somewhat crescentic white spot at about mid-point ; distad to the patch is a series of elongate orange-ochre spots in 4–6, larger and more obscured in 1c–4. Black outer border widest at 7–8, tapers to anal angle ; submarginal blue spots may be large and distinct or small and rather obscured ; marginal lunules well developed, orange ochreous above tails then mixed with greenish to anal angle, the yellowish scaling being limited to base of tails, but divided by the black veins ; upper tail long, 10–13 mm., lower 7 mm., with the " intermediate tail " well developed, thus margin of wing broadly serrate. *Underside*. Ground colour and pattern generally similar to male but with the discal band of upper side fore wing well marked as far as 1b ; ochreous post-discal spots more strongly developed and the marginal ochre spots and lunules darker and more contiguous. Hind wing with the whitish discal band distad to the black zigzag line suffused with brownish, extending from costa and fading out in 1c above anal angle ; post-discal orange-ochre lunules large and more greenish above anal angle ; submarginal lilac and black lunules well developed and ending as two distinct black dots at

anal angle ; marginal orange-ochre lunules well marked and contiguous, hardly divided by ends of dark veins ; extreme edge black.

Neallotype male. TANGANYIKA : Usambara, Amani, xii.1960 (*O'Brien*). British Museum (N.H.).

Range : Type said to have come from " Lindi ", but if from this area, it probably came from the Rondo Plateau, inland from Lindi : consistent trapping in the Newala area has proved negative. Several specimens, both male and female, placed to *maudei*, have now been taken in Tanganyika on the Usambara Range in the high forests above Loshoto at Magamba (*Rydon*) and at Amani (*O'Brien*).

Charaxes xiphares kulal van Someren **stat. n.**

(Pl. 7, figs. 49, 50 ; Pl. 8, figs. 52, 53)

Charaxes kulal van Someren, 1962 : 45 [♂, ♀].

Described as a species, it is now united with *Ch. xiphares* as it shows much more marked affinities to *Ch. xiphares maudei* and *x. burgessi*, than to *Ch. cithaeron*.

MALE. Fore wing length 45–50 mm. *Upperside.* Fore wing ground colour blue-black with strong blue or greeny-blue sheen at base ; discal blue spots large and conjoined at hind margin to form a large quadrate mark ; spots purply-blue, as follows : two spots beyond end of cell, subcostal one elongate followed by a smaller more rounded one, spot in 3 large and rounded and more or less in line with those above, spot in 2 directly below and slightly elongate, spot in 1b set out slightly but fused with blue of lower area and this with the elongate streak in 1a, to form a " block "; post-discal series complete, subcostal spot white and elongate, one below white and round, remaining spots violet-blue and clearly defined and that in 1b fusing with the large discal spot in same area ; marginal black border not strongly concave and with very small internervular ochre dots, hardly visible in some specimens. Hind wing basal area and border blue-black shading to greyish at inner fold ; discal area with a somewhat rounded violet-blue patch with relatively even inner border and only slightly indented on outer side, the upper end reaching to area 5 and here represented by a round spot or an elongate one and separated from the subcostal spot by a black area, the subcostal area may have two spots ; outer black border rather narrow at its lower end by an extension of the blue to just above the anal angle and the very wide marginal lunules, greenish to upper tail and then orange beyond ; submarginal spots complete from costa to hind angle, large and violet-blue in colour ; margin dentate ; tails relatively long as in *maudei* but more robust, largely orange in colour with narrow black edging ; upper tail 9–10 mm., lower 6 mm., slightly curved upward. *Underside.* Ground colour dark olive-greyish. Fore wing post-discal spots less incurved than in *maudei* or *cithaeron* ; discal zigzag line strongly black with more greyish and less ochreous shading distally ; lines in cell and bases of 2 and 3 strongly black, and greyish proximally. Hind wing marks at base more parallel, that in 7 more inward ; the zigzag discal line angled at 2 approximated more closely to the post-discal lunules, and that in 3 towards the black line in cell ; the post-discal crescentic or lunate marks above anal angle strongly black, the remainder less well marked and less accentuated in black ; marginal lunules olive-ochre not strongly indicated but the admarginal contiguous greyish lunules with black distally especially above the tails ; anal angle with a double black dot.

FEMALE. Fore wing length 53–55 mm. thus averaging much larger than males. *Upperside.* Bases of wings deep olive-brownish, darker toward discal bands and on distal portion of fore and hind wing border. Fore wing discal white band complete from costa, which is also white, the five upper marks almost in a straight line on inner border due to sub-basal spot in 3 being in line and not set out as in *maudei* and *burgessi* ; the band has three elongate spots varying

in thickness beyond end of cell, followed by a bluntly triangular spot in 3, a more oval large spot in 2, a small oval spot in 1b contiguous with larger and more elongate spots in 1a and lower part of 1b, these strongly angled proximad with the spot in 2 ; these marks dusted with violet scaling proximally and with ochre distally where contiguously, there are two distinct ochre spots ; post-discal series of spots complete, the first subapical spot is a large elongate white one, followed by a more rounded one in 6, the spot in 5 is directly below, that in 4 just slightly in, that in 3 almost in line, that in 2 just slightly out, but the inward curve thus formed is not as great as in *burgessi* or even *maudei*. The margin is almost devoid of ochre spots, though there is usually an indication of two spots at the tornus in 1b, but even these may be absent, thus differing from *maudei* and *burgessi* in which these tornal spots are strongly marked. Hind wing discal patch is small and broken up, the main area is towards the end of the cell in 2–4 then there is an oval spot set inward in 4, with a more triangular spot at sub-costa, all these spots are strongly lilac ; distad to the main patch is a series of olive-ochre to orange-ochre post-discal spots large and arrow-shaped in 2–3 contiguous with the lilac patch, then two rounded spots in 4–5 touching or separate from the patch, followed by a larger rounded discrete large spot in 5 and a smaller spot above set slightly distad ; the submarginal lilac blue spots large and well marked, double at anal angle ; marginal lunules broad, orange-ochre above the upper tail, greenish-ochre or greenish-lilac at anal angle ; margin of wing dentate, extreme edge black ; tails well developed, thicker than in *maudei*, upper tail 12 mm. long, lower 9 mm. orange centred, black outwardly. *Underside*. Ground colour and pattern as in the male, but fore wing discal bar of above showing up prominently, but extending only to area 1b, and strongly outlined in black internally ; the black lines at base of wing strongly marked ; tornal black spots relatively small, but with wide ochreous border internally ; post-discal spots above in 3–5 obscured but subapical white spots more distinct. Hind wing ground colour and markings as in the male, but post-discal ochre-olive spots rather more distinct.

This female bears quite a strong resemblance to *burgessi* of S.W. Uganda, but is noticeably darker, especially on the hind wing above and below. Although the tails of *kulal*, in both sexes, are longer and more robust than in *burgessi*, there is no doubt that they must be considered conspecific.

Range : This distinctive subspecies of *xiphares* is known only from the isolated Mt. Kulal to the south-east of Lake Rudolf in the Northern Frontier Province of Kenya.

It was first discovered by Mr. T. Adamson, who took a very worn male. In the Spring of 1960 two males and a female were captured by Mr. H. D. van Someren, who in the following year succeeded in taking five males and seven females, most of them in fresh condition. The food plant is unknown.

Charaxes xiphares desmondi van Someren **stat. n.**

(Pl. 8, figs. 54–57)

Charaxes desmondi van Someren 1939 : 176 [♂].

Male. Fore wing length 45–47 mm. *Upperside*. Ground colour deep blue-black with slightly bluer reflections basally ; blue spots very small, smaller than in *maudei* ; the discal series made up as follows : one minute streak hardly visible beyond cell in 5, followed by a rounded spot at base 4, a larger rounded spot sub-basal in 3 set well out from one above, a smaller streak-like mark in 2 just below, a faint indication of blue scaling in 1b above the long narrow streak at hind margin ; post-discal series, one comparatively large white subcostal spot followed by a smaller one more distad in 6, minute blue dots in 4–2, two larger spots set at an angle to each other in 1b ; margin with two ochre spots at tornus followed by smaller spots to subapex. Hind wing black basally shading to dark grey and brown-grey at inner fold ; discal patch relatively large, strongly blue but with white scaling on lower inner side,

inner border irregular, outer border only slightly indented at veins, upper portion of patch in 6 sharply defined and separated by black from the subcostal blue spot ; black border tapering to anal angle, carrying very small submarginal blue dots ; margin with narrow orange lunules, more greenish at anal angle, slightly separated by end of black veins ; margin shows no serration but is entire except for tails ; tails almost entirely black, upper one 6 mm. long, lower 4 mm. *Underside.* Fore wing ground colour olive-brown, rather more ochreous in the cell and distal portion of the wing ; cell crossed by three black lines, the first one heavy ; two narrow lines at apex of the cell ; a small black spot at root of vein 2 ; a crescentic heavy mark at base of 2 ; three U-shaped marks in discal area, one indistinct in 1b, one in 2 and the third in 3, slightly outlined in white distally and shaded with olive-ochre ; the ocelli at tornus made up of two rather separated black spots widely bordered by golden-ochre internally and mauve distally ; post-discal lunules rather indistinct but whitish in subapex ; marginal ochreous lunules distinct at tornus but fading out toward apex. Hind wing ground colour olive-brown, more brownish on inner fold, slightly darker basally ; two fine black lines cross area 8, two at base of 7, a constricted U mark crosses the cell obliquely ; the disc of the wing crossed by faint zigzag white line ; post-discal series of golden-olive lunules, slightly darkened distad extend from anal angle to costa ; marginal lunules greenish at anal angle, more golden above upper tail, are inwardly ornamented with black and mauve admarginal interspaces ; two black spots at anal angle.

Female. Fore wing length 52 mm. *Upperside.* General appearance somewhat intermediate between that of female *xiphares burgessi* and *x. kulal*, thus rather darker than *x. maudei*. Fore wing ground colour black with slight olive shading over basal half ; discal white bar relatively narrow and limited, consisting of three elongate spots beyond the cell, that in base of 4 shorter and more quadrate sub-basal spot in 3 bluntly triangular and set out and in line with the distal edge of the spot above, spot in 2 elongate-oval ; spot in 1b small and orange-ochreous, those in 1a elongate, more diffuse and ochreous, slightly dusted with dark scales ; post-discal spots with the upper subcostal spot whitish with ochre scaling distad, well marked and remainder ochreous and ill defined, those in 1b larger and more defined ; marginal spots large at termen but smaller and less well marked toward the apex. Hind wing ground colour black, shading to greyish at inner fold ; discal patch whitish with strong violet shading especially on distal border, represented at costa by a single quadrate spot with sharply defined inner border. (This discal patch is wider than in *burgessi*, but narrower than in *maudei* and with stronger violet scaling distad.) Beyond the violet shading on the distal edge there are three small strongly orange spots in 4–6 clearly defined within the black border ; submarginal spots small and bluish in 2–5, then hardly visible in 6 ; marginal border narrower than in *burgessi*, each mark less crescentic and in keeping with the narrow border seen in the male, orange above the upper tail then shaded with greenish to anal angle, the border divided by the dark ends of the veins. Edge of wing almost entire as the ends of the veins do not project, thus in keeping with the almost smooth edge seen in the males ; tails black, finer than in *burgessi* and more like *maudei* ; upper tail 7 mm., lower 5 mm. long. *Underside.* Ground colour very similar to that of the male, more light olive-brownish than *burgessi*. Fore wing with the light spots of upperside strongly reproduced ; the post-discal and marginal orange spots strongly defined. Hind wing with discal line indicated by large diffuse greyish-ochreous marks narrowly edged with white and black proximally ; post-discal and marginal orange marks clear and strong.

It is of interest to note that the restriction of the fore wing discal white bar is reminiscent of the limitation of the bar exhibited in southern races of *xiphares*, such as in *penningtoni* van Son.

Neallotype female. Kenya : Teita Range, Chawia-Bura Forests, x.1962 (*H. D. van Someren*). British Museum (N.H.).

Range : This race appears to be very scarce and restricted in distribution and is known only from the Teita Range in S.E. Kenya. The very few recorded specimens were taken in the Chawia-Bura Forest and the forest on Mt. Mbololo.

The recent capture of the neallotype female in the type locality, after a lapse of 23 years since the males were described, is a notable achievement. Five separate visits, at different times of the year, were made especially to try and secure this elusive female. In spite of intensive trapping, successful with other species, this insect appears loath to go into traps. Males have been noted flying around the tree tops, and on one occasion a female was seen at fermenting ooze on high branches of a tree infested with coleopterous larvae. Though traps were hauled up high into the tree the specimens refused to go into them, preferring the natural ooze to the fermenting bait.

Charaxes xiphares wernickei Joicey & Talbot

(Pl. 7, figs. 48 and 51)

Charaxes xiphares wernickei Joicey & Talbot, 1926 : 14.

The unique specimen on which this subspecies of *xiphares* was founded was acquired from the Wernicke Coll. by Joicey, for the Hill Museum, now in the British Museum (N.H.). The specimen bears no collector's name nor date of capture ; it was said to have come from South Cameroon. Considerable collecting has been done in the Cameroons and nearby French Congo during recent years and no specimen of *xiphares* has turned up.

It is known that H. Wernicke himself did not visit Africa and that he was a dealer in entomological material and his personal interest lay in Indo-Malayan specimens.

The brief comparative description of the female type does not mention any character which would readily distinguish it from a South African specimen of *xiphares*, possibly *draconis* or *bavenda* ; moreover the character mentioned relative to the position of the post-discal line of the hind wing below, would seem of doubtful value since the hind portions of both hind wings have been " repaired "!

In my view this specimen is suspect.

Charaxes nandina Rothschild & Jordan

(Pl. 9, figs. 58, 59, 61, 62)

Charaxes nandina Rothschild & Jordan, 1901 : 403 [♂].
Charaxes nandina Rothschild & Jordan ; Rothschild, 1905 : 78 [♀].
Charaxes xiphares nandina Rothschild & Jordan ; Poulton, 1926 : 545, 572.

First described as a species, *nandina* was later associated with *xiphares* by the late Prof. Poulton in 1926. When Dr. van Son (1953) reviewed the races of *Ch. xiphares* he adopted Poulton's allocation but with some reluctance, for although the female *nandina* bears a strong resemblance to females of southern subspecies of *xiphares*, there are strong differences in pattern, not only in this sex, but in the male also. Moreover, if indeed *nandina* is only a subspecies of *xiphares*, it is most remarkable that, whereas races of *xiphares* to the north have gradually evolved away from the nominate pattern, and through gradual transitions to the quite

different looking pattern of *brevicaudatus*, *burgessi*, *maudei*, and *kulal*, *nandina* should suddenly revert to a nominate-like southern pattern and coloration in the highlands of Kenya!

The possibility of mimetic resemblance does not, in my opinion, arise, for in the Nairobi area where *nandina* is common, possible "models" are rare. The differences in the male genitalia of *nandina*, *xiphares* and *cithaeron* are not great, but *nandina* shows the greatest departure from the others, which are extremely similar.

My considered opinion is that *nandina* is a distinct species.

Ch. nandina has been seen laying on *Hippocratea obtusifolia* (Hippocrateaceae), also on *Crabia*, but its chief foodplant in the Ngong area is *Drypetes gerrardii* Hutch. (Euphorbiaceae) (*D. battiscombei*, syn.), on which numerous specimens have been reared. The foodplant of *xiphares* is *Cryptocarya woodi* Engl. (Laurineae) in the Natal area. I have compared the larvae of *nandina* at all stages, with those of *xiphares* as depicted by Gowan Clark and they are markedly different.

Male. Fore wing length 45–50 mm., majority 47 mm. *Upperside.* Ground colour deep blue-black, with brighter blue sheen at base of fore wing especially in the cell ; fore wing discal spots white with sparse bluish scaling around them ; two spots beyond cell, the upper one a narrow streak, lower one larger and ovoid ; spot at sub-base 3 more rounded and set well out, that in 2 more elongate and set slightly obliquely ; upper proximal spot on v.2 small and blue or absent, but distal spot clear and oval ; lower spot in 1b elongate and well marked ; a long blue streak on hind margin and separated from the spot above ; post-discal series of spots clear, those from costa to 2 white in colour, the lower two often with slight orange scaling ; marginal orange-ochre spots, double in 1b at tornus small but clear ; outer margin of wing only slightly concave at 3–4. Hind wing ground colour blue-black, more black on distal part of inner fold shading to greyish on inner margin ; discal blue patch rather narrow, starting at 2 it crosses the apex of the cell to 4, and represented on the subcosta by a large rounded or oval white spot with bluish scaling on lower side ; distal and separate from the discal patch, is a series of post-discal, well marked blue spots starting in 2 and reaching the subcosta where the spot is often white, the spot in 6 is set in and may fuse with the discal patch here. (This post-discal series of spots is not found in any subspecies of *xiphares*.) Complete row of sub-marginal blue spots, double at anal angle, may be small and rounded or larger and more triangular, but well marked ; marginal orange-ochre lunules extend from anal angle to upper angle, or stop short in area below ; margin of wing bluntly dentate ; tails long and slender, upper one 8 mm., lower 5 mm., black centred. *Underside.* Ground colour fore wing olive-grey, more greyish toward hind portion, more golden tinged in cell area and distad to the discal line ; cell with a straight line in sub-base, followed by a curved transverse line at mid and third distance, a double line at and just beyond cell, all lines black edged with white ; a small black dot at base 1b with a triangular mark beyond ; a straight line at base of 2, black and white internally ; discal line wavy black with white outer border ; post-discal row of spots as above, upper spots whitish with orange scaling distally usually rounded, those in 1b–2 crescentic and orange-tawny, inwardly black adjacent to tornal black spots which are relatively small, that in 1b almost divided, outwardly edged with greyish-lilac ; marginal lunules clear at tornus but less marked towards subapex. Hind wing ground colour as fore wing ; thin black wavy lines through cell and sub-base of 6 ; rather thin discal wavy line white and black, extends from costa to above anal angle, with an outward kink at 3 ; post-discal olive-ochre lunules shaded lilac and black at anal angle reach the costa ; marginal olive-ochre lunules shaded lilac internally are black spotted above the tails, a double black spot at anal angle.

Female. Fore wing length 51–57 mm. *Upperside.* Ground colour black when fresh but tending to brownish toward base of fore wing. Fore wing discal bar white or with just a

slight creamy tinge and with spots as follows : a small streak may or may not be present at subcosta, followed by a long oval spot then by a blunt triangular mark, base towards end of cell, spot in 3 set well out, oval in form and below this a long oval or somewhat triangular long mark in 2 ; there may be a minute dot below the distal end of this spot in 1b ; post-discal spots are well defined, large in the subapex, slightly smaller to spot in 3 which is set in a little, all usually white, but those in 1b and 2 are smaller and ochre in colour ; there is usually a long rather diffuse ochre mark along the hind margin. Hind wing, base blackish shading to greyish-brown, then paler along inner fold ; border black ; discal patch large and ochre in colour reaching to base of 4 proximally, inner border not sharply defined, outer border more clear-cut especially toward upper half where the patch is represented by a large quadrate subcostal mark usually whitish or slightly ochre in colour ; distal to this patch there is a complete row of large ochre spots starting at subcosta in 7 to just above the anal angle in 2 ; these spots may be free, contiguous to or merged into the discal patch at or below 5 and these spots correspond to the post-discal series of the male and in a majority of females, the spots are free especially in the upper half ; submarginal spots small, blue or violet-blue in colour ; marginal lunules well developed, ochre above upper tail, slightly greenish at anal angle ; tails long and slender, upper 10–11 mm., lower 6–7 mm., black. *Underside.* Ground colour generally similar to that of the male ; rather less " satiny " with golden reflections in the distal half of the fore wing and with the discal bar strongly indicated. Fore wing basal lines as in the male, discal white bar outlined in black proximally ; post-discal and tornal marks strong ; marginal golden-ochre lunules strong at tornus but fading towards subapex. Hind wing basal marks in 7 broadly white internally ; discal band white proximally, shaded with brownish scales distally and sharply delineated by black internally ; post-discal marks from upper tail to costa crescentic, white, proximally lined in black ; hind angle marks greeny-ochre lightly black proximally and broadly black distally ; submarginal lunules lilac with black distal outline, double spot at anal angle ; marginal lunules ochre-olive above tails, more greenish to anal angle.

Range : The chief area inhabited by this species is the semi-dry forests of the Nairobi-Ngong districts, Karura, Langata, Ndeya, upper Kikuyu. It occurs also in the higher forests of Uplands, Katamayu, Escarpment, the southern Aberdares and on the south-eastern slopes of Mt. Kenya. Though recorded from Nandi-Sotik, I have no authentic records from west of the Rift Valley. A specimen in the British Museum (N.H.) said to have come from " Old Moshi " south Mt. Kilimanjaro is certainly incorrectly labelled.

Systematic List

Charaxes xiphares (Cramer)

Charaxes xiphares xiphares (Cramer), 1781. Type locality : Eastern Cape Province, van Stadens to Knysna.

f. *occidentalis* van Son, 1953. Type locality : Groot-vaderbosch, Swellendam. Range : Swellendam to van Stadens, Port Elizabeth.

thyestes (Stoll), 1790.

Synonyms : *reducta* Rothschild, 1929. (*elatias* Jordan, 1936). Type locality : Somerset East. Range : Eastern Cape Province including Pondoland, Zourberg to Port St. Johns.

penningtoni van Son, 1953. Type locality : Champagne Castle, Natal.

♀ f. *luminosa* van Son, 1953. Range : Natal, in higher forests National Park, Champagne Castle, Balgown ; also Eshowe and Rietvlei.

draconis Jordan, 1936. Type locality : Mariepskop, Lydenburg District.

♀ f. *candida* van Son, 1953. Range : Forests of Drakensberg Range from south of Oliphant's River to Barberton.

kenwayi Poulton, 1929. Type locality : Haenetsberg, Pietersburg, Transvaal.

♀ f. *lutea* van Son, 1953. Range : Forests of Volkberg Range, north of Oliphant's River.

bavenda van Son, 1935. Type locality : Zoutpansberg. Entabeni, N. Transvaal.

♀ f. *ochreomacula* van Son, 1935.

♀ f. *cyanescens* van Son, 1935. Range : Forests of Zoutpansberg Range. N. Transvaal.

vumbui van Son, 1936. Type locality : Elephant Forest, Vumba Mts., Umtali district, S. Rhodesia. Range : Forests on eastern border of S. Rhodesia, Umtali to Chirinda Forest.

woodi ssp. n. Type locality : Cholo, S. Nyasaland. Range : Southern area of Nyasaland ; Cholo and Limbe.

brevicaudatus (Schultze), 1913. Type locality : Manow, north of Lake Nyasa S.W. Tanganyika Territory. Range : The southern highlands forest on Mts. Poroto and Rungwe ; Mbeya, Manow, Songea, Iringa and ? Morogoro. Recently taken on Nyika Plateau, Nyasaland.

burgessi van Son, 1953. Type locality : Ruhiza and Mafuga forests, Kigezi, S.W. Uganda.

maudei Joicey & Talbot, 1918. Type locality : " Lindi "; Tanganyika Territory. Range : ? Lindi area, possibly Rondo Plateau, but definitely on higher forests of Usambara Mts.

kulal van Someren, 1962. Type locality : Mt. Kulal, east side Lake Rudolf, northern frontier Kenya. Range : Known only from Mt. Kulal.

desmondi van Someren, 1939. Type locality : Teita Hills, Kenya. Range : The forests of the Teita Range, Chawia, Wandanyi. Mbololo.

wernickei Joicey & Talbot, 1927. Type locality : Southern Cameroons.
This specimen and locality are suspect.

Charaxes nandina Rothschild & Jordan

Charaxes nandina Rothschild & Jordan, 1901. Type locality : Escarpment Uplands, Kikuyu. Range : The forests of Nairobi area to Upper Kikuyu, Katamayo, southern Aberdares. Meru, Mt. Kenya, east of Rift Valley. Records from Nandi-Sotik doubtful.

2. *CHARAXES SMARAGDALIS* BUTLER, AND ITS SUBSPECIES

The first critical examination of *Charaxes smaragdalis* Butler appears to be that by Rothschild & Jordan (1900).* At that time, only one subspecies was recognized, *butleri* Rothschild. The authors pointed out that the name *princeps*, applied by Butler to specimens from Cameroons, was a renaming of the nominate race and that in reality, the race without a name was that of Sierra Leone and the Gold Coast, which Rothschild named *butleri*. They included within the range of the nominate race, a male specimen from Rau, Nandi, East Africa, but noted certain differences which appeared to them to suggest that *smaragdalis* was related to *Ch. cithaeron* Felder, and might even be " geographical representatives of one species ". It is true that the two do not overlap in distribution, but for very sound reasons they are now considered to be two distinct species.

Aurivillius, in " Seitz " (1911), supported Rothschild & Jordan in recognizing two subspecies of *smaragdalis*. Joicey & Talbot (1917) recognized a third race from the Kericho-Sotik area of Kenya which they named *orientalis*, unfortunately overlooking the fact that this name had already been used by Staudinger (1896) for the eastern subspecies of *Ch. castor* (Cramer) ; but Staudinger also appeared unaware that Butler (1895) had already named the eastern *castor* as *flavifasciatus*.

However, the name *orientalis* Joicey & Talbot remained in use until recently (cf. Ghesquiére (1933) and Carpenter & Jackson (1950 : 97–98), when the latter described what they took to be the female of *orientalis*). But Felix Bryk (1939) had already indicated that *orientalis* could not be employed for the eastern race of *smaragdalis* and published the substitute name *homonymus*, but apparently without giving full reasons for the change, except that *orientalis* was preoccupied.

Carpenter & Jackson (1950) described the female " form " *caerulea* from Kalinzu, W. Uganda, comparing it with *orientalis* Joicey & Talbot, but Jackson (1951 : 99–100) raised *caerulea* to subspecific rank, and briefly referred to the associated male. He too, overlooked the name *homonymus*, and used the name *orientalis* Joicey & Talbot for the eastern race of *smaragdalis*.

During the last twenty years, and especially in the past decade, extensive material of *smaragdalis* has been accumulated and the species is now known to range over a much more extended area than was previously thought. A study of this material indicated the desirability of revising the species on a pan-African basis, and for this purpose I have brought together a very considerable material representative of the present known range of *Ch. smaragdalis*.

*In this paper, the descriptions of new species and subspecies are by Rothschild alone.

Unfortunately, it has been impossible to work out the regional distribution of the species in some areas, such as Gabun, and Cameroons owing to paucity of material and one has had to rely on a small " sampling ". The species has a very wide range extending from Sierra Leone in the west to Kenya in the east, with a marked concentration along the equatorial belt especially of the Congo and eastern Africa, but in the latter area which has been subjected in the past to much volcanic and tectonic disturbance, with consequent change in climate and vegetation, especially along the two main Rifts, the species has not only survived but has evolved into several geographical races.

It is these subspecies which I propose to consider in detail and to correlate them with long-recognised races.

In this paper, the terms " subspecies " and " geographical race " are treated as synonymous ; a " form " as a genetical strain ; a variety as a variation from the general pattern, occurring occasionally ; and an aberration, usually individual, turning up rarely, affecting shape, pattern or colour.

When considering the distribution of *smaragdalis* within the Congo on a broad basis, one must take into consideration the general topography of the country and its vegetational characters. One of the chief physical features throughout the northern half of its distribution is the great Congo River, and the Kasai River and its tributaries in the southern section ; but these by themselves, except in the mid and lower reaches of the former are not important as ecological barriers. Of far greater importance is the vegetational coverage, combined with altitude. The great block of the Lowland Rain forest, roughly 4 degrees north and south of the Equator has a fairly uniform type of *smaragdalis*, agreeing in the main with the nominotypical subspecies, but in the east where the forest borders on the Albertine Rift there is a line of high montane forest extending from N.W. of Lake Tanganyika to the west of Lake Edward, then broken in the Semliki Valley area but appearing again north-west of Lake Albert. In this break in the chain of montane forests, the lowland rain forest extends eastward to the Semliki and to the Bwamba Valley, west of Ruwenzori. In the eastern protrusion of the forest, from Beni to Irumu, *smaragdalis* tends to be large and with slightly less blue on the upper surface than nominotypical specimens, and to the northward, in the Kibali-Ituri area, especially toward the west of Lake Albert, specimens exhibit even greater reduction of the amount of blue in the hind wing, with consequent broadening of the black border. There is thus a tendency toward the race *caerulea* of the eastern side of the Rift. Similarly, we find that *smaragdalis* of the western Kivu and at the north end of Lake Tanganyika is definitely allied to the race inhabiting the high forests of western Uganda, Kalinzu, and Kayonza in Kigezi, i.e. the race *caerulea* in which the females are more male-like and lack the decided white-blue fore wing bar, the discal spots being blue. Another derivative of this is found in the high forests of Toro.

In the southern Congo, outside the area of the Lowland Rain Forest, viz. Katanga, Kasai and Sankuru, where the forest areas are mostly of the gallery type along rivers, in otherwise open grass savanna and wooded savanna, and scattered forest patches, *smaragdalis* exhibits a degree of instability, some tending toward the

north-eastern races, the majority toward the nominotypical, to which, for the time being they must be placed. In the Leopoldville area divergence is again more noticeable. Some males I have examined have been determined as "*butleri*" on account of the reduced area of blue in the hind-wing, and Ghesquière compared his *leopoldi* with "*orientalis*" for the same reason. The females in this area are variable : one from Leopoldville has the fore wing discal bar composed of separate, relatively small, white-centred blue spots in the upper half and uniform blue in the hind portion ; two others are nearer the nominotypical subspecies, but with slightly narrower bars.

It is quite possible that when a more detailed survey of the terrain of the southern Congo has been carried out, it will be found that the area can be divided up into definite ecological zones each with a distinctive environment and that the variations which at the present appear mixed up, are in reality each limited to a specific area (cf. Map 2).

Bearing in mind the fact that *Ch. smaragdalis* has a very wide west to east distribution, covering areas without strong ecological barriers, especially in the Congo, thus lessening the reproductive isolation of some of the subspecies, there is as I have shown, some instability of racial characteristics as evidenced by the few, but a large majority are stable. In the eastern area of its distribution, i.e. east of the Albertine Rift, there is this isolation and the races are well defined. In contrast to the continuity and consequent uniformity of environment of the northern Congo, we find that to the east of the western Rift suitable forest habitats are scattered and well separated by unsuitable grass and savanna country as follows (cf. Map 3) :—

1. A limited area of forested hills in the Metu-Moyo district of West Madi, West Nile district of Uganda, and forested mountains in southern Sudan.
2. The isolated forests of Budongo and Bugoma east of Lake Albert, and the forests of Toro.
3. The high forests of south west Ankole area, Kalinzu etc., which by gallery forests merge into 4.
4. The high forests of Kigezi, Ruhiza, and Mafuga, which in turn link up with the great impenetrable forests of Kayonza and the Ishasha Gorge and by stages to the forested mountains of the Mufumbiro Range, the region of volcanoes in Ruanda and so to west Kivu and the north end of Lake Tanganyika, on the west.
5. The considerable area of lowland rain forest on the west side of Lake Victoria :— the Katera and Tero forests north of the Kagera River in Uganda, the forests of the Kagera river system in the north Bukoba district of Tanganyika, south to Biharamulo and Geita.
6. The area of primary forest to the north and west of Mt. Elgon, in the Mbale district of Uganda. The mountain on this side belongs to the archaic basement complex ; and the forests, or what remains of them, are relicts of the distant past when primary forest probably extended right across Uganda. The main forests are the Bufumbo and Bumasifa to the north of Mt. Kokanjero. The south and eastern slopes of Mt. Elgon are largely volcanic, and the forests

secondary. South of Mt. Elgon the country is mainly savanna with small patches of riverine heavier growth or open grass-land as on the Uasin Gishu Plateau.

7. The Nandi forest, and further west the Kapwaren forest, composed of three main areas, the Kaimosi forest, the Kakamega forest and the Kabras forest, at roughly 5,000 ft. in North Nyanza, flanked to the south by the Maragoli Escarpment overlooking the low central Kavirondo plains at 3,700 ft., which are an efficient barrier.
8. The high Mau country with heavy forest in the valleys at 8,000–9,000 ft., with the Elgeyo Escarpment to the north-east but to the south-east of the Mau across the Lumbwa Valley there are extensive forests to the Kericho-Sotik area at 6,000 ft, with areas of broken forest toward the Mara River, the Chepalungu Forest and toward the Kisii Highlands. There are no large forests east of this though several gallery forests exist in the Suna area.

It will be noted from this broad survey of the forested areas inhabited by *smaragdalis*, that the species does not extend east of the Rift Valley in Kenya, and the majority of the eastern subspecies lie between the Albertine Rift and the high ground west of the eastern Rift and around Lake Victoria. It is of interest to note that whereas in the majority of races there is a uniformity of pattern in the females conforming to that of the nominotypical, i.e. a conspicuous white discal bar in the fore wing, it is in the east and the Kivu area of the Albertine Rift that the females retain a more male-like pattern. Whether this is a relic of an ancestral pattern or a recent trend, is a matter of considerable interest.

Strangely enough, there are no records of *smaragdalis* to the north and south-east of Lake Victoria, though in the former there are apparently suitable forests such as those around Entebbe, Mawakota and the extensive Mabira Forest. There are now no large forests in Busoga and the area of the Nile with its entry into the Sud-covered Lake Kioga, is devoid of suitable habitats for *smaragdalis*.

Descriptions and Notes

Charaxes smaragdalis smaragdalis Butler

(Pl. 9, figs. 60, 63 ; Pl. 10, figs. 64–70 ; Pl. 11, figs. 71–76)

Charaxes smaragdalis Butler, 1865 : 630 [♂].
Charaxes smaragdalis Butler, 1869 : 5 [♀].
Charaxes princeps Butler, 1896 : 376.

As pointed out by Rothschild & Jordan (1900), and now generally accepted, the nominate race is that occupying the Nigerias to the equatorial zone of the Congo and Gabun.

Male. Fore wing length 45–47 mm., mostly 46 mm. *Upperside.* Ground colour blue-black with slight green sheen at base fore wing (this may be slightly purply-brown in old specimens) ; fore wing discal band strong, blue with slight greenish tinge when fresh, slightly purply-violet tinged when oxidised ; spots comparatively large, two, with an occasional streak

below costa, at end of cell ; spot in base of 4 blunt arrow-shape, set a little distad to outer end of spot above ; spot below quadrate, toward base with a streak extension along vein 3, spot in 2 long quadrate, that in 1b similar, while the streak in hind margin extends distad to the post-discal area, the bases of the last three spots almost in a line and at an angle to spots above ; post-discal spots well developed, two subapical spots white, upper one larger and elongate-quadrate, spots in 5 round or angular, spot in 4 set in a little, that in 3 and 2 also set in so that these three are at an angle to subapical spots ; spots toward tornus increasingly arrow-shaped and contiguous to or fused with long spots in 1a–1b ; margin with double spot at tornus, small but visible, to just below apex ; wing margin very slightly concave at 3. Hind wing basal area black, shading to greyish at inner fold ; discal patch light greeny-blue (slightly purply in old specimens) large, represented by two separate spots below costa, then with slightly curved outer border reaching to hind margin at upper tail, so that the black outer border is mainly in the upper half, widest at 6 and carrying a series of blue, white-centred submarginal spots, those toward the hind angle with black surround ; marginal lunules blue with whitish ends, fused with the discal patch at anal angle and discrete above upper tail ; margin of wing bluntly serrate ; fringe white between veins ; tails short : upper 5 mm., lower 2–3 mm. *Underside.* Ground colour dark olive-grey-brown with olive-ochre interspaces at base of fore wing, ochre shading distal to black discal marks and on outer border ; black marks strong, three cross bars in cell, a double bar at end of cell, strong sub-basal marks upper part 1b and 2 ; crescentic black marks (lines) broadly bordered with olive-ochre in the discal line ; post-discal row of spots, whitish at subapex become larger and crescentic, ending in a large blue-black tornal " eye-spot " slightly margined with lilac outwardly, bifid on outer aspect ; marginal olive-ochre lunules clear at hind angle but fading out toward apex. Hind wing ground colour olive-grey-brown ; black lines thin, those at base and disc of wing enclosing or bordered by olive-ochre, post-discal crescentic marks olive-ochre edged with whitish internally, blackish externally run from subcosta to anal angle ; submarginal white triangular spots with lilac and black distally extend from subcosta to anal angle where the spot is double ; marginal lunules olive-ochre, more greenish at anal angle ; extreme edge black with white internervular fringing line. The whole underside has a speckled appearance, with the white submarginal spots in hind wing showing up clearly.

Female. Fore wing length 48–52 mm. *Upperside.* Ground colour black distally and with bluish-green sheen on basal black ; fore wing discal bar broadly white ; costa white where bar begins, subcostal mark narrow, next elongate and extending well beyond the third more quadrate mark at end of cell ; subbasal spot in 4 bluntly triangular, set out toward end of the spot above, outer side straight and forming a line with the larger spot in 2, these two spots edged with light blue proximad ; large elongate marks in 1a–1b pale blue and reaching almost to the tornal angle, the latter with two long, oval whitish areas in centre ; post-discal spots : two upper ones white and distinct, the first one elongate-concave, the second more rounded or quadrate, lower spots blue and not so distinct set at an angle to upper ones, the one in 2 set out at an angle, those of 1b fused with the discal mark ; marginal spots, double at tornus, blue or whitish ; extreme edge of wing white internervularly. Hind wing basal area black with a slightly greenish tinge merging into the greyish-brown on inner fold ; discal pale blue patch large, extending to the anal angle and area above upper tail, represented at costa by a more greyish-blue mark or by two marks ; marginal black border thus limited to an area in region of upper angle ; submarginal spots bluish with white centres in this border then as smaller bluish-white spots with black surround in the extended discal blue in the anal angle ; marginal bluish-white lunules strongly marked above upper tail ; extreme edge white in bay between veins ; margin of wing bluntly serrate. *Underside.* Much as in the male but the discal white bar corresponding to that of upperside is extended to upper part of 1b, while the black tornal spots are larger and the black centres of the post-discal spots of upperside are here large and elongate.

Range : The nominate subspecies has a range from Nigeria, Cameroons, Gabun to French Congo and the greater part of the " Lowland Rain Forest " of the Congo

reaching the eastern border, which is bounded by the high montane forest west of the Albertine Rift. There is however an extension of the " Lowland Rain Forest " to the north of the montane ridge in an eastward direction, and this reaches the Semliki River and crosses into the Bwamba region west of Ruwenzori. This eastern projection runs roughly from Beni to Irumu and north to Mahagi. In this area *smaragdalis* exhibits a definite tendency to be large, the males have a fore wing length of 48–52 mm. averaging 50 mm. with the blue of the fore wing slightly less extended toward the tornus and a slight restriction of the discal patch in the hind wing above the upper and lower tails. The females show a similar tendency of restricted blue and white areas above.

As there appears to be some variation in these characters and no ecological barriers, it seems best to consider the Beni-Irumu insects as merely a generally larger form, ***beni* forma n.,** Pl. 9, fig. 63.

Charaxes smaragdalis butleri Rothschild

(Pl. 11, figs. 77, 78)

Charaxes smaragdalis butleri Rothschild in Rothschild & Jordan, 1900 : 385 [♂, ♀].

Male. Fore wing length 43–48 mm. *Upperside.* Ground colour as in the nominate race ; blue spots of discal bar and those of the post-discal series smaller and not extended so distad toward the tornus but carried more proximad along the hind margin ; there is thus a wider black border to the fore wing, but a reduction in the basal black and a greater angling of the upper blue spots and a more solid blue area in the posterior section of the band ; marginal spots more distinct. Hind wing differs from the nominate subspecies in the greatly reduced blue patch distally, with a consequent greater width of the black border especially in the area above the tails, this then results in all the blue spots of the submargin being free, even to the double spot at the anal angle. The blue areas are, on the whole, more greenish than in the nominate race. The tails have a distinct white line. *Underside.* Very similar to the nominate subspecies, but with the fore wing triangular discocellular marks wider and paler.

Female. Fore wing length 47–50 mm. *Upperside.* Pattern generally similar to the nominate *smaragdalis* but fore wing white band broader, largely due to the third spot beyond cell being longer while the white areas in marks in 1b are longer ; the pale blue in this area not carried toward the tornus ; post-discal spots absent except the two white ones in subapex ; marginal spots, even the tornal ones very faint or missing. Hind wing pale blue discal patch more restricted, leaving a considerable black border to anal angle ; the blue area represented at costa by two separate spots ; submarginal spots and marginal triangles clear and defined from anal angle to subcosta ; those in the latter with rather more white ; tails about same length as in nominate race, and with a white central streak. *Underside.* Ground colour and pattern similar to the male but with the broad fore wing white bar clearly marked and extending to 1b ; the post-discal marks in the form of ocelli, very black centred and rounded from tornus up to 3, then more ovoid and less black up to the costa ; whitish marginal triangles in hind wing very marked above upper tail.

Range : Sierra Leone to Ghana.

Charaxes smaragdalis leopoldi Ghesquière

(Pl. 12, figs. 79–84)

Charaxes smaragdalis leopoldi Ghesquière, 1933 : 4 [♂].

This seems an appropriate point at which to consider the rather mixed population of the southern portion of the Congo, outside the " Lowland Rain Forest belt ",

inhabiting the broken areas of forest and gallery forests of the savanna country to which I have already made reference.

From amongst this aggregate, Monsieur M. J. Ghesquière has described two " regional forms " which are to be considered as subspecies (see Ghesquière, 1933 : 5).

The subspecies which concerns us at this juncture is *leopoldi*. The type comes from Komi (Ter. Lodja), a paratype from " La Kondue, bords du Sankuru ", and a male from Leopoldville, Sohal. The type was figured, by Ghesquière and the figure is here reproduced by permission (Pl. 12, fig. 79). The characters cited for this race are not very satisfactory ; the strong green reflections toward the base of the fore wing and the broken blue patch in the hind border in 1a–1b are characters found in variations of *smaragdalis* from throughout the savanna and gallery forests of the southern Congo, as is also the variation of the blue of the hind wing extending towards the anal angle.

I have not seen the specimen from Sankuru, but the example from Sohal agrees with other specimens from the Leopoldville area and north-western Angola, in having a distinct black border to the hind wing, thus unlike nominate *smaragdalis*. (Cf. Pl. 10.) Moreover, the females from Leopoldville are unlike nominate *smaragdalis* in that the fore wing white bar is narrower and is often represented by well separated spots, reminiscent of the subspecies *caerulea*, to the east, at Manyema etc.

Although the characters of this race are unsatisfactory, and the exact range undefined, one must admit that the insects are not nominate *smaragdalis*, and since the name *leopoldi* is available it can be applied to the insects from Northern Angola and the Leopoldville district eastward to Sankuru and Kasai.

Material from Katanga is totally inadequate on which to form any conclusions.

Charaxes smaragdalis caerulea Jackson

(Pl. 12, figs. 85–87 ; Pl. 13, figs. 88–93 ; Pl. 14, figs. 94–98)

Charaxes smaragdalis ♀ f. *caerulea* Carpenter & Jackson, 1950 : 97 [♀].
Charaxes smaragdalis caerulea Jackson, 1951 : 99.

Described originally as a " form " this aggregate was rightly raised to sub-specific status by Jackson (1951 : 99) when he described the associated male.

MALE. Fore wing length 46–51 mm., majority 50 mm., thus a large race. *Upperside.* Ground colour deep blue-black with a strong greenish or bluish-green sheen over the base of the fore-wing ; discal blue spots smaller than in the nominate subspecies from Nigeria and French Congo and more like the large form from Beni ; two blue spots beyond cell, first spot narrow and elongate, second spot rounded or quadrate ; sub-basal spot in 3 set well out, rounded or triangular, spot below in 2 more elongate and at an angle to one above, spot in 1b often separated or fused with spot above, always well away from the hind angle. Hind wing discal blue patch is rather restricted in the majority of specimens, being almost straight on its inner border and though curved on the outer there is a defined black border right up to the anal angle, the patch represented at the subcosta by one or two rounded well separated spots ; the black border carries a complete series of bluish-white spots, smaller and double at anal angle ; marginal lunules blue, slightly whitish toward upper angle ; margin bluntly serrate ; tails short, upper 4–5 mm., lower 3 mm. *Underside.* Much as in the nominate race, slightly less dark, but markings similar except that the mid-discal black marks are heavier, and in the hind wing the black edgings to the sub-marginal lunules are stronger.

The original description of the female is brief in the extreme, but it does give the salient features.

FEMALE. Characterized by absence of white from the discal row of spots on the fore wing. Fore wing, two narrow, bluish-white, subapical spots in 6–7 are all that exist of the outer series which in the male extends from 2 forwards (in some of the paratypes the series is complete though faintly shown). None of the blue spots in areas 1a, 1b, 2, 3, 5 and the end of the cell, show any white and they are of the same tint as the discal band of the hind wing which shows no white suffusion in the costal area as does the typical female *smaragdalis* Butler. Hind wing like that of the male *S. orientalis* Joicey & Talbot. On the under surface both wings resemble those of the male *S. orientalis*.

Up to the time of publication of this description this race was not known to occur beyond the Kalinzu area, Ankole. It is now recorded from Kayonza, Kigezi and extends into the east Congo in the Kivu-Manyema districts. The Kayonza insects are large ; those of Kivu smaller and more like the Kalinzu examples. They are here treated as belonging to one race. The Kayonza females exhibit the following variations :—

Fore wing length 50–55 mm., mostly 53 mm. *Upperside.* Ground colour black in distal half, more brownish at base with a greenish sheen. The typical female has the discal spots large and blue, but the overall width of the band is narrower than that in the white-banded races. The marks in 1a and 1b are usually fused, the post-discal spots conspicuous and white in the subapex, indistinct and bluish up to 1b where a double spot, usually bluish may have some ochre scaling distally. In some examples from Kayonza, the spots in 2–5 may be orange-ochre, but ill defined. From this area too, come females which have white or bluish-white fore wing discal spots from 2 to spots at end of cell. A scarce variation occurs in which the four upper discal marks are narrow streaks. The margin of the wing usually has a double ochre mark in 1b and hardly any visible marks up to the apex. Hind wing blue discal patch has an almost straight inner border, and more curved outer border, and is represented at subcosta by one or two discrete spots. Black border entire and not encroached upon by blue even at the anal angle, carries a complete row of submarginal angular spots, more bluish at hind angle then more whitish up to upper angle ; marginal lunules well developed, bluish or greenish to upper tail then ochreous beyond and separated by black veins ; margin of wing very slightly bluntly serrate ; upper tail 7 mm., lower 4 mm. *Underside.* As in the male, but with the discal bar of upperside represented by a strong zigzag black line outwardly shaded with greyish-ochre (or white in white spotted variety) ; tornal spots distinct but not heavy, spot in 1b often divided. Hind wing as in the male but markings enlarged.

The variations in the Kayonza females are not worthy of form or even varietal names as there is intergrading.

Range : Ankole district, Kalinzu Forest, extending to the Kayonza forests (Impenetrable and Ishasha) in Kigezi district, S.W. Uganda, then to the Kivu and Manyema districts of East Congo.

Charaxes smaragdalis toro ssp. n.

(Pl. 14, figs. 99–101 ; Pl. 15, figs. 102–107)

Specimens of *smaragdalis* from the Toro district, Utwara, Mpanga and Kibale Forests, though allied to the race *caerulea*, differ sufficiently to warrant recognition as a distinct subspecies. There is a wide ecological barrier between the two in the form of grassland and savanna which is unsuited to the species.

MALE. Fore wing length 45–48 mm. (rarely over). *Upperside.* Ground colour purply-black, with purply-brown tinge at base ; fore wing discal spots smaller and darker, with a decided violet tinge ; the spots in 1b and 2 completely separated, the streak on the hind margin often very small and not connected with spot above and may be just a single spot under the post-discal series, very rarely a long streak ; post-discal series well marked : two subapical spots large and white, spot below often white, spot in 1b not connected to discal mark ; marginal spots very well developed and white or slightly ochre tinged. Hind wing discal patch narrow almost as in *homonymus* with resultant wider black border with no extension of the blue into the anal angle ; submarginal spots in black border comparatively large, blue with white centres ; admarginal lunules, blue at tails but whitish beyond ; blue areas have a distinct violet tinge, not in any way due to age, tails as in *caerulea*. The whole upperside of this race has a more spotted appearance than any others. *Underside.* Ground colour more brownish than *caerulea* and ochreous marks and shading more in evidence.

FEMALE. There is some variation in size, but they are generally smaller than *caerulea* with an average wing length 50 mm. Conforms to the *caerulea* pattern but the discal and post-discal spots are separated in areas 1b–2 and the streak at hind margin separated from spots above as in the males. Hind wing patch more restricted than in *caerulea* ; the submarginal spots in black border usually distinct.

Holotype male. UGANDA : Toro district, Kibale Forest, v–vi.1956 (*van Someren*). British Museum (N.H.).

Allotype female. Same data; British Museum (N.H.).

Range : This subspecies, in the typical form, is limited to the forests of the Toro area, east of the Ruwenzori Range, and has been taken in the Utwara, Mpanga and Kibale forests. An allied form occurs in the Bugoma forest east of Lake Albert. The males are very similar to those from the Kayonza forest, but with rather more extension of the blue of the hind wing into the area above the tails, thus somewhat like specimens from Kibali-Ituri. The females, on the other hand, belong to the *caerulea* type. Unfortunately, there is insufficient material to place these insects satisfactorily. (Pl. 15, figs. 105–107.)

Charaxes smaragdalis elgonae ssp. n.

(Pl. 16, figs. 110–113)

MALE. Fore wing length 46 mm. *Upperside.* Ground colour blue-black with slight greeny-blue sheen at base ; fore wing discal blue bar well marked and wider than in *homonymus*, more like the N.E. Congo form from Beni ; spots as follows : beyond cell end, a trace of a blue mark below costa, followed by a narrow elongate one, then a rounded one ; the spot in 3 set well out from one above, quadrate or bluntly triangular, mark in 2 directly below but elongated at lower side and almost crescentic in shape, either separated from or almost touching the double spot in 1b the lower half of which is extended distad ; the blue mark in hind angle long and almost reaching the tornus ; post-discal spots well defined, the two subapical ones white, the rest blue and becoming more arrow-head shaped, the lower one fusing with the mark in 1b ; marginal spots whitish-ochre extend from apex to a double mark at tornus. Hind wing basal area black, shading to dark grey then lighter grey at inner fold ; discal area with a large blue patch, purer blue, not shot with violet as in *homonymus* and much more extended, reaching to the anal angle and to the upper tail, thus much as in the nominate race *smaragdalis* ; the patch represented in subcostal area by two widely separated blue spots ; black border thus restricted to upper half of the wing, but the submarginal bluish-white spots with a black surround in hind angle, complete ; marginal lunules blue with whitish ends ; margin very bluntly

serrate ; tails short, upper 6 mm., lower 4 mm., largely blue or whitish, black edged. *Underside.* Darker than in *homonymus* but pattern as in the nominate race, black markings fore wing strong, with olive-ochre shading distad to discal black line, submarginal lunules and ocelli well marked ; tornal spot almost divided into two. Hind wing submarginal pale spots clear ; marginal olive-ochre lunules clear but not strong ; mottling on underside thus moderately strong.

Female. Fore wing length 50 mm. *Upperside.* Bears a strong resemblance to that of *homonymus* but fore wing discal band narrower and white marks rather more separated by black veins ; spots in 1b smaller and more suffused with blue. Hind wing discal blue patch encroaches more into area of hind angle. *Underside.* Ground colour greyer and colder in colour than in the male, but markings very similar ; discal white bar fore wing well marked and white to area 1b.

Holotype male. E. Uganda : Mbale District at Bufumbo Forest, W. Mt. Elgon, xii.1950 (*van Someren*). British Museum (N.H.).

Allotype female. Same locality, iii.1962 (*I. Grahame*). British Museum (N.H.).

Range : At present known only from the forests of W. Elgon, Bufumbo and Bumasifa, which are primeval, and harbour several " western " relicts, thus in contrast to the eastern and southern side of the mountain which is volcanic, with secondary forest.

Charaxes smaragdalis : intermediate, a cline between *elgonae* and *homonymus*

(Pl. 15, figs. 108, 109)

The species *smaragdalis* occurs sparingly in the Kapwaren Forest, N.W. Kenya, comprising the Kaimosi-Kakamega and the Kabras-Malaba forests. These lie almost mid-way between the forests of the Elgon massif and the Mau forests to the south-east.

Examples from the Kapwaren forest are a mixed aggregate ; the males are comparatively large, some exhibit an upperside pattern very similar to male *elgonae* Pl. 15, figs. 108–109, others show a strong tendency toward *homonymus* of the high Kericho-Sotik-Chepalungu forests.

Although male specimens have been taken occasionally, the female has proved elusive. A female taken many years ago is not now available for study, but one taken recently in the Kaimosi forest by Dr. Arthur Rydon has been placed at my disposal.

It will be noted therefore that this aggregate exhibits no constant features on which to define characters of a sub-species ; it thus seems advisable to leave it as a cline.

Up to date, no specimens of *smaragdalis* have been taken in the forests of central Uganda on the north shore of Lake Victoria (Mabira, Kampala, Entebbe, Mengo, Mawakota, Kamengo and Mpigi), so far as I know, in spite of considerable collecting with traps. There is however a specimen in the British Museum (N.H.) said to have been taken on Bavuma Island south of Jinja in Busoga, which seems to link up with the Kapwaren aggregate and those of the Katera area on west shore of Lake Victoria.

Charaxes smaragdalis homonymus Bryk

(Pl. 16, figs. 114–116 ; Pl. 17, figs. 117–119)

Charaxes smaragdalis orientalis Joicey & Talbot, 1917 : 272 [♂] nec Lanz, 1896.
Charaxes smaragdalis homonymus Bryk, 1939 : 444.

This race long known as *orientalis* Joicey & Talbot even by Carpenter (1950) and by Jackson (1951), must now be accepted as *homonymus* Bryk.

There has been some confusion as to what *homonymus* (*orientalis*) really is. The type, a male, came from Kericho, Kenya ; the female was unknown. Carpenter described what he took to be the female of this race, but his example came from Kikindu Hill, Kagera area between Uganda and Tanganyika Territory, on the other side of Lake Victoria, and later I shall deal with the race to which it belongs.

Male. Fore wing length 43–46 mm. *Upperside.* Ground colour blue-black with strong blue basal sheen in fore wing ; discal bar blue spots as follows : two elongate spots of equal length, or lower one shorter and more quadrate beyond the cell ; spot in 3 bluntly triangular and set well out, followed by a larger spot in 2 whose lower edge projects distad, followed by a double fused spot in 1b and an elongate blue mark on the hind margin, usually well clear of the tornus ; post-discal spots usually well developed, two in subapex white, remaining spots blue, that in 5 directly below one above, that in 4–3 set in proximad, the one in 2 crescentic or triangular, that in 1b free or fused with the large discal spot in 1b ; marginal white or slightly ochreous spots usually well marked. Hind wing, basal area black shading to greyish on inner fold ; discal blue patch comparatively narrow, represented at subcosta by two separate spots, fairly even on the inner border, more curved on outer, but leaving a well defined black border which extends to the anal angle, black veins often cross the blue patch ; the black border carries a complete series of submarginal bluish white-centred spots ; marginal lunules blue with some white at tips, separated by dark veins ; margin with white fringe in interspaces, bluntly serrate ; tails short, upper 3–4 mm., lower 2–3 mm., mostly black. The blue areas in this race are slightly purply tinged, especially on the disc of the hind wing even in fresh specimens. *Underside.* Ground colour greyish-olive brown with olive-ochre filling between basal black lines and distad to the strong black wavy discal line ; markings in general similar to those of other races. Hind wing markings not very strong and the ochre shading not in great contrast so that the whole underside is not so speckled or mottled as in some races.

Female. Fore wing length 47–51 mm. *Upperside.* Ground colour, distal half black, more brownish black in basal area ; discal bar white, moderately wide but not as wide as in western races ; slightly variable ; the white bar beyond cell includes the costa, subcostal mark narrow, second mark elongate, third mark more bluntly triangular ; spot in 3 set out at end of spot above, bluntly triangular, with outer side straight, oblique and in line with the outer edge of the larger spot below in 2 ; smaller double whitish marks in 1b with bluish scaling around, mostly distad ; marks at hind margin blue and well away from tornus ; post-discal spots at subapex elongate and white, remainder bluish and heavily obscured ; marginal spots fairly clear at tornus but obscured or absent beyond. Hind wing basal area black fading to greyish on inner fold ; discal patch blue with slight violet tinge, not very sharply defined proximally but clear-cut distally, represented at subcosta by two separate blue spots ; black border entire to anal angle carrying a submarginal row of bluish-white spots, double at anal angle ; marginal lunules blue at anal angle and tails then tinged with ochre to upper angle ; margin with white internervular fringe, bluntly serrate ; tails : upper 8 mm., lower 4–5 mm., mostly black. *Underside.* Ground colour as in the male or slightly paler ; markings similar but fore wing discal white bar strongly represented and with two well defined white marks in 1b. There is some variation in the amount of ochreous speckling or mottling.

Neallotype female. Kenya : Sotik district, Mara-Lolgogian Rd., Gori Forest, i.1961 (*H. D. van Someren*). British Museum (N.H.).

Range : The subspecies *homonymus* is an insect of the high rain forests of 6,000–7,000 ft. of the Kericho-Sotik area of Kenya. It has been taken at Kericho, Sotik, Mara, Kisii and near Lolgorian, always in or on borders of forest.

Charaxes smaragdalis kagera ssp. n.

(Pl. 17, figs. 120–122 ; Pl. 18, figs. 123, 124, 127, 128)

Charaxes smaragdalis orientalis Joicey & Talbot ; Carpenter & Jackson, 1950 : 97 [♀ neallotype].

Carpenter & Jackson (1950) refer to this insect as *orientalis* Joicey & Talbot when they describe a female as of this race, which Carpenter took at Kakindu Hill, Budu, Uganda, 30 miles inland from the Lake shore. However, in the book " A Naturalist in East Africa " (1925), Carpenter states that Kakindu is on the north bank of the Kagera River, inland from Bukoba, just south of the Uganda border. The locality of the " type female " is of great importance because males of *smaragdalis* taken in the Kagera area, and at Katera and Tero forest nearby are *not* " orientalis ", though they resemble that race in certain respects.

Male. Fore wing length 50 mm. *Upperside.* Ground colour blue-black with a greeny-blue sheen basally, discal spots comparatively large, larger than in subspecies *toro* and agreeing more with *homonymus* ; the spots in 1b large and confluent with the post-discal spots in the same area ; the post-discal spots well marked, the two subapical ones white, the upper one noticeably large. Hind wing discal blue area wider than in *homonymus*, but black border entire to anal angle ; the submarginal spots well developed, blue in region of tails, are white toward tornus ; admarginal lunules whitish ; tails slightly longer than in *homonymus* and with a distinct white line on lower half, upper tail 6 mm., lower 3–4 mm. *Underside.* More brownish in ground colour and less strongly mottled than in more western races with the dark markings less strong. Carpenter described the female, but he compared it with *butleri* of Sierra Leone and Gold Coast which is unfortunate.

Female. Fore wing distal portion black ; basal area strongly scaled with violet and less dark than in *homonymus* ; discal white band comparatively narrow ; three spots beyond end of cell, spot in 3 bluntly arrow-shape with outer edge straight and in line with a longer spot in 2, spots in 1b small and set in line with outer end of spot above ; post-discal series hardly visible except the two subapical ones which are large and white, the upper one slightly concave as in the male. Hind wing ground colour, basal area not strongly defined from disc, being strongly greyish-violet ; discal area violet-blue restricted distally so that black border is entire and carries large ovoid white submarginal spots ; marginal lunules elongate, purply-white. *Underside.* Ground colour as in the male ; discal white band of upperside showing through ; post-discal spots clearer, ochreous-olive except for the two subapical ones which are white.

Holotype female, Kakindu Hill, north bank Kagera River, near Uganda border (*Carpenter*). Oxford Museum.

Allotype male. Uganda : Katera forest, Masaka district, north of Kagera River mouth, viii.1935 (*T. H. E. Jackson*). British Museum (N.H.).

Range : The western shores of Lake Victoria from the Katera and Tero forests, the Kagera forests to Biharamulu at Geita. The forests on the west shore of Lake Victoria are almost at lake level and some are swamp-forests 3,700–4,000 ft. with higher elevations here and there.

Charaxes smaragdalis kigoma ssp. n.

(Pl. 19, figs. 131, 132, 135)

This is a small race closely related to the subspecies *kagera* of the low forests on the south-western shores of Lake Victoria, and likewise, *kigoma* is also associated with low lake-side forests but from the north-east of Lake Tanganyika.

Male. Fore wing length 42 mm. (39 mm. in paratype). *Upperside.* General pattern very like *kagera* ; fore wing discal spots similar, but tending to be larger and more confluent at hind margin in 1a–1b in the type, though smaller and more separated in the paratype ; post-discal spots not strongly developed, except the two subapical whitish ones. Hind wing discal blue restricted and bordered by a complete black submarginal band, widest in 6, and still clearly defined above anal angle, and carrying a complete row of small blue spots ; marginal lunules blue ; tails short, 3 mm. and 2 mm. long. *Underside.* Pattern and mottling generally similar to *kagera*, but black markings less strong.

The female is unfortunately represented only by a pair of left-side wings which are reasonably intact, and give a clear indication to which group *kigoma* belongs.

Female. Fore wing length 51 mm. *Upperside.* Ground colour black with just a slight bluish sheen at base ; discal bar white in upper two-thirds, spots in 1b with blue scaling proximally, wholly blue in 1a ; the discal bar is widest at 2, the spot above in 3 a longer elongate oval than in *kagera* ; post-discal spots represented by two white marks at subapex, the subcostal one narrow and linear, the other small and rounded ; no other visible spots. Hind wing basal area dull brownish-black ; blue discal area comparatively restricted with a black border well defined from upper angle to anal angle, widest in 6–7 ; submarginal white-centred blue spots in complete series, rounded in upper third then becoming more linear towards anal angle, admarginal lunules rather broken, blue with slight white at ends ; tails not robust, black in colour, upper 7 mm., lower 4 mm. *Underside.* Ground colour rather cold leaden colour, slightly " satiny "; pattern not strongly developed, but olive-ochre marks in post-discal line present and well developed in fore wing especially internal to the black ocelli.

Holotype male. Tanganyika : Mukuvu forest south of Kigoma, north-east shore Lake Tanganyika, v.1962. Japanese scientific Expedition.

Allotype female. Same locality, 25.v.62. Both deposited in British Museum (N.H.), by kind permission of the collectors.

Range : Taken in the low lake-side forest at Mukuvu, south of Kigoma, N.E. Lake Tanganyika. The extent of range is uncertain.

Charaxes smaragdalis metu ssp. n.

(Pl. 18, figs. 125, 126, 129, 130)

Male. Fore wing length 43–45 mm., thus a small race. *Upperside.* Ground colour of fore wing strongly blue-black with slight greeny-blue sheen at base ; the blue areas more greeny-blue than in other eastern races, *elgonae* or *homonymus*, and more like *butleri* of Sierra Leone ; fore wing discal bar relatively strong, particularly in the hind marginal area ; three spots beyond cell : subcostal one a streak, next spot narrow and elongate, third more quadrate or triangular ; spot in 3 arrow-head shaped, that in 2 a long crescentic or " comma " mark. those in 1b elongate, and together with mark at hind margin extended basad and toward tornus, so that the patch here is large. (One paratype less prolonged basad.) Hind wing blue patch extended well into the hind angle to a point mid-way between tails, and represented in the subcostal area by an angular spot proximally, and a quadrate one distally, conjoined

along their lower border ; black border thus limited to upper half of wing, carrying a submarginal series of bluish-white spots in the upper half, those in lower half with a black surround; marginal lunules in upper half bluish-white, blue towards anal angle ; margin bluntly serrate; tails, upper 5 mm., lower 3 mm., rather robust, largely bluish-white and black tipped. *Underside.* Ground colour darker than *homonymus* or *elgonae*; bars at base of fore wing strong, discal black lines moderately strong, but submarginal olive-ochre lunules and ocelli well marked ; tornal black mark heavily incised ; marginal lunules present but not strong. Hind wing marks as in *elgonae*, olive-ochre " mottling " strong, with black shading to outer side ; post-discal lunules strong ; submarginal whitish spots well marked ; marginal olive-ochre lunules well developed.

Female. Fore wing length 47–49 mm. *Upperside.* Ground colour on distal half fore wing black, basal area more brownish with slight greenish tinge ; discal bar white, and rather narrow; costa above slightly white, subcostal spot very narrow, next mark elongate and projecting well beyond one above and the more quadrate one below at end of cell, spot toward base of 3 elongate ovoid or slightly triangular and set well out, its distal side oblique and in line with the outer side of the elongate triangular spot in 2, two white spots in 1b strongly suffused with light blue particularly proximad, with the blue extending toward the base and in line with inner point of spot in 2 which is also slightly blue in this area, blue mark at hind margin extended proximad and also distad toward tornus ; post-discal spots large and white in subapex, blue and rather indistinct or absent except that in 2 which is large, crescentic or rounded in shape, adjoining the large white discal spot in this area. Hind wing basal area black, shading to grey along the inner fold ; discal pale blue patch large, inner border rather diffuse along fold and base of cell, extending to anal angle and above second tail, represented in subcostal area by one large outer and one small inner spot ; border black, widest at 7 then tapering to upper tail ; submarginal spots clear and white at upper angle then blue, white centred towards anal angle, the spots surrounded by black and contiguous between tails ; marginal lunules strong and bluish from anal angle to above upper tail then mixed with some pale ochre ; extreme edge with white fringe between veins ; margin bluntly serrate ; tails, upper 6 mm., thin, lower 3 mm., mostly black. *Underside.* As in the male, but rather browner ; fore wing black lines strong, discal white bar well marked up to 1b ; post-discal lunules and ocelli well marked, two upper spots white ; tornal spot black and divided, two spots above strongly black centred. Hind wing black lines fine but ochre-olive shading strong, especially along the post-discal lunules which are dark centred ; submarginal whitish spots with black shading distally, well marked ; marginal lunules olive-ochre, well defined.

Holotype male. Uganda : West Nile District, N.W. Madi, Forest of Metu Hills, v–vi. 1954, (*van Someren*). British Museum (N.H.).

Allotype female. Same data.

Range : This is the smallest subspecies of *smaragdalis* and occurs in the forested hills of the Metu area, of West Madi, in the West Nile district of Uganda. It probably extends into the Southern Sudan, on the Dadinga Mts. where Carpenter took a worn male which he tentatively placed to *homonymus* (*orientalis* Joicey & Talbot).

Charaxes schoutedeni Ghesquière **stat. n.**

Charaxes smaragdalis schoutedeni Ghesquière, 1933 : 5, pl. 1, fig. 2.
Charaxes butleri schoutedeni Ghesquière, 1933 : 5.

The type of *schoutedeni* Ghesquière, which I have before me, taken at Merodé, Salvator, Kasai, is the only known specimen. It was first described as a "form reg." (i.e. subspecies) of *smaragdalis*, then possibly as a subspecies of *butleri* Rothschild.

MALE. *Upperside.* fore wing basal areas greenish-blue covering the greater part of the cell and the basal areas of 1a–2 where the blue scaling merges into the discal blue spots which are here merged together forming a solid large blue patch, but those of 3 and beyond the cell are free. The post-discal spots in the subapex are well marked and white, the upper one long and slightly convex, the remaining post-discal spots are hardly visible at all, except those in 1b. The hind wing discal blue extends basad, more so than in nominate *smaragdalis*, but distally there is a broad black border carrying large submarginal blue spots. The marginal lunules are strongly greenish-blue and the tails very short. *Underside.* This is stated by Ghesquière to be identical with that of *smaragdalis leopoldi* Ghesquière but this is not strictly correct as it is duller and not so " mottled ".

Ghesquière notes that the upperside of the hind wing resembles to some extent that of *smaragdalis butleri* of Sierra Leone and Ghana, particularly in regard to the wide black border, and in this respect also to " *orientalis* " Joicey & Talbot= *homonymus* Bryk. This is certainly the case, but there the resemblance ends.

The squat thick-set shape of the body to which Ghesquière appears to attach considerable importance, is an artifact, due to partial decomposition and flattening of the thorax so that the wing attachments are extruded from their sockets. He suggests that *butleri* has a similar shaped body, but I have examined many examples of *butleri* and I cannot see that they differ in body shape from nominate *smaragdalis*. Thus the suggested re-allocation proposed by Ghesquière that *butleri* and *schoutedeni* are representatives of a species distinct from *smaragdalis* is untenable, because unsound.

The type of *schoutedeni* may be an extreme variant of *smaragdalis leopoldi ;* on the other hand, it exhibits certain characters which are suggestive of an affinity to *Charaxes bohemanni*. These are : upperside fore wing has two large subapical white spots, the upper one convex ; the remainder of the post-discal spots are suppressed ; the blue of the hind wing extends basad but does not encroach on the wide black border, this border with submarginal spots set more distad than in *smaragdalis* and the marginal lunules are set *on* the margin and not admarginal. *Underside.* The ground colour is matt as in *bohemanni*, and not strongly mottled and lined with olive-ochre as in *smaragdalis*. The insect bears no resemblance to *Ch. smaragdalis homonymus* Bryk except that it has a wide black border to the hind wing, and in this respect agrees with *smaragdalis butleri* Rothschild.

Dr. Berger (*in litt.*), is of the opinion that both *leopoldi* and *schoutedeni* are varieties of nominate *smaragdalis*, but, as I have pointed out, the *leopoldi* aggregate differ considerably from nominotypical *smaragdalis*. It is of interest to note that amongst some of the specimens I have examined a few had previously been determined as *butleri*, based, no doubt, on the wide hind wing black border.

It is unfortunate that examination of genitalia is of no assistance in separating these closely related species.

SYSTEMATIC LIST

Charaxes smaragdalis Butler

Charaxes smaragdalis smaragdalis Butler, 1865. Type female. Type locality : " Congo ". Neallotype male. 1869. Type locality: " Congo ".

Range : Nigeria, Cameroons, Gubun, French Congo, Equatorial lowland Rain Forest, Congo to Uelle. (Not Nandi as stated by Rothschild.)

f. *beni* forma n. Range : The Beni-Ituri area, eastern Congo.

butleri Rothschild, 1900. Type locality : Sierra Leone. Range : Sierra Leone to Gold Coast.

leopoldi Ghesquière, 1933. Type locality : Komi, Lodja district, Congo. Range : Southern west Congo, Leopoldville, Lower Congo, Sankuru, Kasai ; North Angola.

caerulea Carpenter & Jackson, 1950. Type female (f.n.) Jackson, 1951. Type locality : Kalinzu forest, Ankole, Uganda. Range : W. Uganda, forests of Kalinzu, Ankole ; Kayonza forest, Kigezi, S.W. Uganda ; the Kivu and Manyema districts Eastern Congo.

toro ssp. n. Type locality : Toro forests. Range : The forests of Toro, Mpanga and Kibali, Utwara, W. Uganda. Bugoma Forest, east side Lake Albert.

elgonae ssp. n. Type locality : Bufumbo forest, west Mt. Elgon, Mbale district, Uganda. Range : The forests of Western Mt. Elgon : Bufumbo and Bumasifa, Uganda.

ssp. near *elgonae* Range : The Kapwaren forests : Kaimosi, Kakamega, Kabras and Nandi Escarpment in Kenya ; Buvuma Island near Jinja, Uganda.

homonymus Bryk, 1939. Syn. *orientalis* Joicey & Talbot 1917 nec. Lanz 1896. Type locality : Kericho, Kenya. (Neallotype female, Carpenter & Jackson, 1950. Budu, Uganda . . . error = female *kagerae*). Range : The high forests of the Kericho-Sotik area in Kenya ; also Chepalungu and Mara.

kagera ssp. n. Type locality : Katera and Kagera river forests. Range : W. shore Lake Victoria ; low forests of Kagera River area, Bukoba to Geita in Tanganyika Territory, Katera and Tero forests Masaka district, Uganda.

kigoma ssp. n. Type locality : Mukuvu forest, Kigoma district N.E. Lake Tanganyika, Tanganyika Territory. Range : Only known from type locality.

metu ssp. n. Type locality : Metu, West Madi, West Nile district, Uganda. Range : The forested hills of Metu-Moyo, West Nile district of Uganda ; S.W. Southern Sudan.

Charaxes schoutedeni Ghesquière, 1933. Type locality : Merode, Salvator, Kasai, Congo.

Of doubtful affinity, this unique specimen exhibits characters which suggest relationship to *Charaxes bohemanni* Felder.

3. *Charaxes cithaeron* Felder and its Subspecies

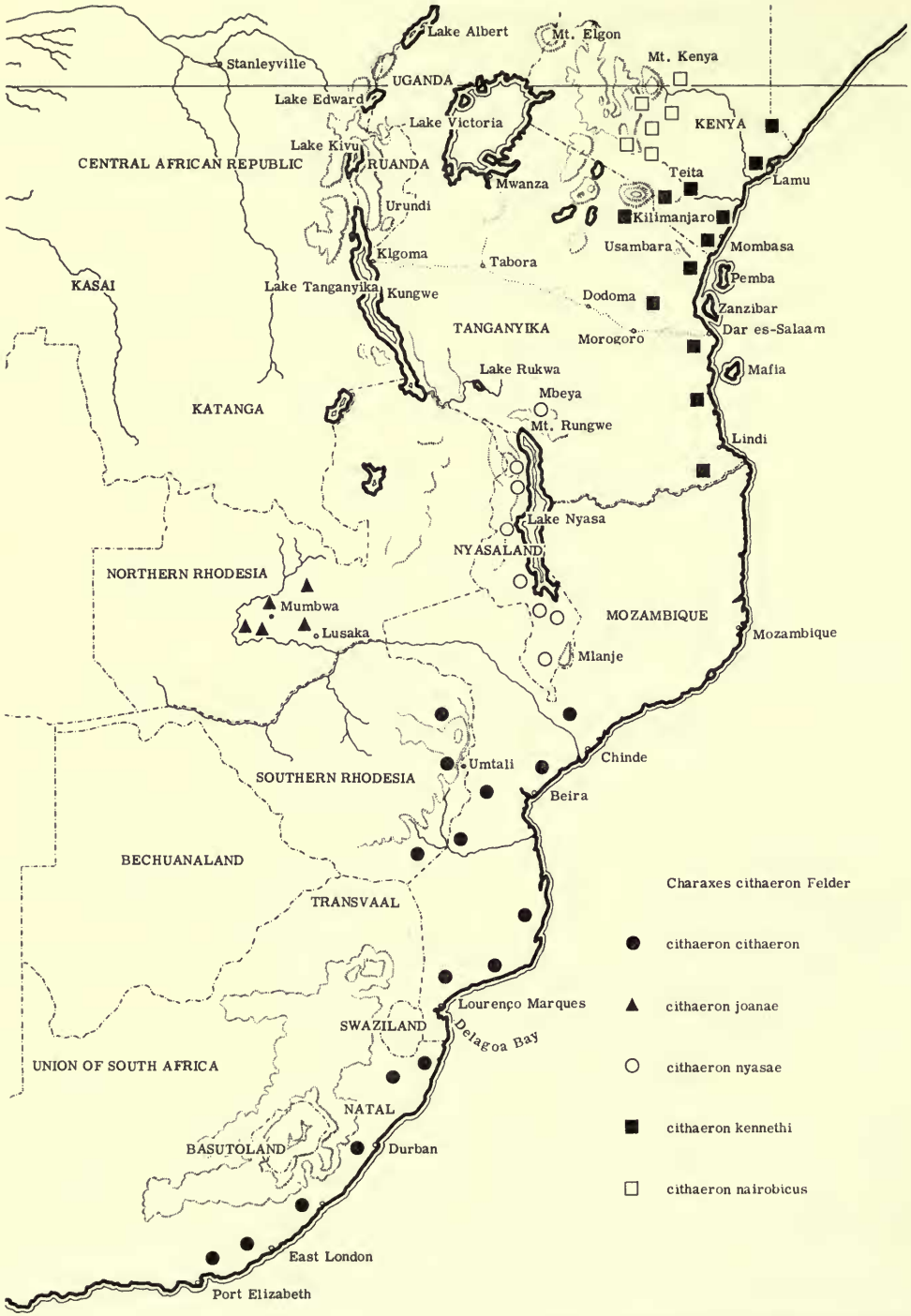
This species, so far as is known at present, like *Charaxes xiphares*, is more or less confined to the south-east and eastern regions of Africa, ranging from Pondoland in eastern Cape Colony northwards to Kenya. It bears a close resemblance to some of the northern subspecies of *Ch. xiphares* with which I have already dealt ; indeed, some races of *xiphares* were at one time considered to be subspecies of *cithaeron*.

Charaxes cithaeron was described in 1859, from Natal, and most of the early references to the species were based on material from the southern areas of its range. Rothschild & Jordan (1900 : 379) appear to have been the first to draw attention to the fact that specimens from the Kenya coast at Mombasa differed from Natal examples by having broader fore wing bars and wider hind wing patches, and remark that the differences pointed out may be found to be more or less constant. Poulton (1926 : 539) separated the Mombasa specimens as subspecies *kennethi*, with the type locality as Mombasa, but he appears to have considered the Kenya highland material as nominotypical *cithaeron*. In my papers on *Charaxes* of Kenya and Uganda (1929 : 17), I upheld the race *kennethi* as applicable to Kenya coast specimens, but placed the Kenya highland examples as *cithaeron cithaeron*, thus following Poulton's lead, but I was not entirely satisfied that this was correct.

Early in 1953, Dr. van Son informed me that he was about to review the subspecies of *Charaxes xiphares* and at the same time would be going into the races of *cithaeron* because there appeared to be some real confusion of the two, more particularly in regard to certain specimens recorded from Tanganyika. The results of his investigations were published in 1953 and on the evidence of material from the Nairobi area, Dr. van Son separated and described the Kenya highland race of *cithaeron* as ssp. *nairobicus*. At the same time he came to the conclusion that *kennethi* was not a good race but merely a wide barred variation of typical *cithaeron* from Natal, giving the range of the nominotypical race as from " Pondoland in eastern Cape Province to the coastal area of Kenya ". He thus assumed that there was a continuous distribution of this race through the length of Mozambique and Tanganyika and the coast of Kenya. He figured a female from Beira with a broad fore wing bar and wide hind wing patch as " form *kennethi* Poulton ", but in the text states that the specimen came from Pietermaritzburg, Natal! He does not figure a topotypical *kennethi* from the Mombasa area, but refers to a figure of this race which I had published (van Someren, 1929, pl. 83).

Although van Son reduces *kennethi* to the status of " form " because one does, on occasion, find a broad barred insect amongst southern material, he admits that the vast majority of Natal females have narrow fore wing bars and narrow hind wing patches. He does not compare the respective males in detail. That *kennethi* may merge with nominotypical *cithaeron* somewhere along the Mozambique coast is not disputed, but I personally have not been able to examine any material from northern Mozambique, north of Chinde, nor, I think, has van Son.

Dr. van Son is strongly of the opinion that a subspecies or geographical race to be valid, must be reproductionally isolated from its nearest neighbour ; this in the main does obtain, but there are cases where a widespread adaptable species



MAP 4. Sketch map of South-east and East Africa, showing distribution of *Charaxes cithaeron* Felder and subspecies.

with many food plants has split up into ecological groups each covering wide areas, but which are linked together, in minor degree by " clines "!

It is of interest to note that although van Son (1953 : 219, 221–2) places all *kennethi* as merely a form of the nominotypical Natal race, he places *maudei* Joicey & Talbot from an area intermediate between Natal *cithaeron* and true *kennethi*, as a race of *cithaeron*. However, I am satisfied that *maudei* is not a race of *cithaeron*, but of *xiphares*, and that *kennethi* and *maudei* occur together on the Usambara Range, at Amani, in Tanganyika (see pp. 233 and 206).

Dr. van Son has pointed out that in contrast to the general habitat of *xiphares* which frequents higher cool evergreen forests, *cithaeron* is found in the low tropical forests of the coast belt and hinterland, and in patches of savanna and gallery forest, thus inhabiting a diversity of forest types. Moreover, the range and diversity of its food plants is very considerable. The following food plants are recorded :—

In southern Africa : *Albizia* (2 species), *Acacia* sp., *Baphia* sp. (LEGUMINOSAE) ; *Celtis* sp., *Chaetacme* sp., *Trema* sp. (ULMACEAE).

In Kenya and Tanganyika : *Afzelia* sp., *Crabia* sp., *Albizia* sp. (LEGUMINOSAE) ; *Gymnosporia* sp. (CELASTRACEAE) ; *Hippocratea* sp. (HIPPOCRATEACEAE) ; *Grewia* sp. (TILIACEAE).

All these plants are very widespread and are associated with most forest types, and it is surprising therefore that the species *cithaeron* has such a comparatively restricted range, and, so far as is known, has not extended into the north-west of Tanganyika nor into the Congo.

In some areas of its range, the countries are subject to marked wet and dry periods, and it is not surprising to find some degree of seasonal variation in *cithaeron* and I shall refer to this later.

Through the willing co-operation of many correspondents, I have been able to bring together a very large amount of material representative of the species throughout its known range ; these include the eastern Cape, and Natal, southern Mozambique, Southern Rhodesia, Nyasaland and Northern Rhodesia, southern and eastern Tanganyika and Kenya.

In analysing this material into groups, I have been guided by what appears to be the predominant characters of each, in both sexes, and the stability of them. In every group there are variations, tending one way or another and some evidence of seasonal modification. In the descriptions which follow I have selected fresh examples exhibiting constancy of the chief characters, and where minor differences occur, these are mentioned. I shall also refer to, and wherever possible figure, outstanding variations within the series.

Charaxes cithaeron cithaeron Felder

(Pl. 19, figs. 133, 134, 136, 137 ; Pl. 20, figs. 138, 139)

Charaxes cithaeron Felder, 1859 : 398, pl. 8, figs. 2 ♂, 3 ♀.
Charaxes cithaeron Felder ; Rothschild & Jordan, 1900 : 379.

A detailed description of the species is given by Rothschild & Jordan (1900 : 379), based presumably on south African material, but since the range of the species is

given as " from Natal northward to Nyasaland, German and British East Africa " it may include material subsequently separated off as distinct subspecies. It is thought that a redescription of topotypical Natal material is desirable.

Male. Fore wing length 41–45 mm., majority 43–44 mm. *Upperside.* Ground colour blue-black with a strong blue sheen mainly on basal half ; fore wing costa brownish on basal portion ; two rows of comparatively small blue spots, discal and post-discal ; the spots in the former are two elongate beyond end of cell (very rarely a trace of a subcostal blue line), spots in 3–4 more rounded and set out distad, spot in 2 usually vestigial, often absent ; usually no spot in 1b, but if present rather diffuse ; elongate blue line in 1a on hind margin usually free, but may be contiguous to, but not fused with post-discal spot above ; post-discal spots run parallel to outer margin of wing and are comparatively small ; subapical spots white, remainder blue, often vestigial. Hind wing black, slightly shot with blue distally, but dull toward base ; inner fold blackish at base shading to greyish at anal angle ; discal light patch comparatively narrow, whitish on inner half toward fold but strongly bluish above and distally, extending from 4–5 where it is narrow, then widening towards inner fold, sometimes represented in 5 by a rounded, separate or contiguous, blue spot and by a whitish-blue subcostal spot rather diffuse or often absent ; submarginal row of blue spots, angular or elongate, double at anal angle, becoming small and separate or fading out toward upper angle ; marginal lunules buff to ochreous, more greenish at anal angle separating toward upper angle ; fringe narrowly white, broken by ends of veins ; margin dentate ; tails long and thin, upper 5–8 mm. (seldom longer), lower 3–4 mm., black edged, centre line buff. *Underside.* Light greyish-olive with a slight tawny bloom over base of fore wing and disc of hind wing ; black transverse lines at base fore wing fairly constant as regards position but varying in thickness ; sub-basal bar in cell almost straight, second and third bars slightly angled ; a double bar at end of cell ; thicker sub-basal bars in 1b and 2 almost straight or crescentic ; a zigzag black line outlines the inner edge of the irregular ochreous-olive discal bar ; the post-discal marks of upperside here represented by two whitish subapical spots followed by rounded or lunate ochreous marks increasing in size, the lower ones encircling the tornal black spot and the one above ; the tornal mark somewhat kidney-shaped, indented on the outer aspect ; ochreous marginal spots complete but small. Hind wing basal lines thin, usually double and enclosing ochreous ill-defined bands, that in sub-basal area of subcostal in 8 almost straight, that in 7 set out and contiguous with marks crossing cell and somewhat S-shaped, and not extending into 1c ; a discal zigzag narrow black line runs along the inner edge of the more ochreous-olive discal line ; post-discal spots ochreous, dusky on outer aspect and increasing in size from costa to anal angle, are mostly crescentic, that at anal angle double ; submarginal spots, purply-mauve proximally, are increasingly purply-black distally terminating in double spot at anal angle ; marginal lunules ochreous with increasing green scaling between tails and anal angle.

Female. Fore wing length 44–50 mm., somewhat variable, usually about 48 mm. *Upperside.* Ground colour blue-black on distal portions, bluer along proximal edge of fore wing white band ; browner toward base ; (old specimens are generally browner, especially in basal area). Fore wing discal white band curved, extending from costa to hind margin ; outer border more evenly curved than inner, white scaling on costa extending basad for about half its length ; three elongate white marks at end of cell, middle one longest and projecting distad, bases of all three in a line ; spot in 3 bluntly triangular and set out from spot above at about mid point, its outer border oblique ; spot in 2 more elongate, proximally rounded and in line with spot above, but outer oblique edge continuous with that above and in same line ; mark below shorter, outer edge in line with one above but inner edge reaching to about middle only, while the lower marks in 1b and mark in 1a extend proximad, the last three at an angle to spots above, so that the inner border of the discal band has a marked double kink, at vein 2 and in line with the lower arm of the cell ; the distance of the band in 1a–1b from the tornal margin is wide, though slightly variable, usually 7–10 mm., often the latter. The white mark in 1a may be slightly blue scaled ; postdiscal spots variable in number, but always with two large

subapical, white or buff, the spots in 4–3 if present rather indistinct ; margin with hardly any indication of spots, but there may be two at tornus. Hind wing with large bluish-white discal patch shaded with bluish-violet scaling distally, inner border almost straight but rather diffuse, usually represented on the subcosta by one discrete spot or two contiguous spots, outer border of patch more curved and merging into the inner fold above anal angle ; discal patch variable in width, but on an average is 10–11 mm. wide in area 4, but is often considerably narrower. When the band is narrow, there may be an indication of whitish post-discal spots in 3–4. The submarginal row of rounded or triangular blue spots with white centres may be complete or fading out at upper angle ; marginal ochre lunules may be contiguous or separate, fading out at upper angle ; marginal black with hardly any indication of a white fringe ; tails mostly black, thin, variable in length, upper 6–10 mm., lower 4–6 mm. *Underside.* As in the male but fore wing discal band well marked and stopping short in 1b ; the black lines more developed; post-discal lunules of hind wing often more strongly marked ; zigzag discal line may be strongly edged whitish, almost forming a bar, but is usually narrow.

Variations. Females. An extreme variant may have the streak in 1a of discal bar only just indicated while the two spots in 1b are reduced to small dots, the discal bar is thus incomplete and shortened in its posterior portion. A further variant has the discal band complete but reduced to half the normal width, conversely a specimen from Dondo, Mozambique has an exceptionally wide fore wing discal band, the increase in width being due to an extension of the white marks in 2–3 basad, and reaching the cell, while that in 1b is extended basad only slightly less. The proximal border of the band is far less indented and more evenly curved than normal.

Males. There is little variation in the upper side. A very small minority may have larger discal blue spots in the fore wing than normal, and the blue streak in 1a may link up with the lower spot in 1b. In the hind wing the whitish blue patch may not be represented beyond cellule 4 and the light subcostal spot is absent.

Range : The nominotypical race extends from Pondoland up the east coast to Natal, Zululand and Swaziland to Beira in south Mozambique (Dondo and Amatongas) then westward to the eastern side of S. Rhodesia. It has usually been presumed that the species has a continuous distribution through the northern part of Mozambique to Tanganyika and beyond, but I have been unable to trace any specimens of the nominotypical race north of the Zambesi Valley.

Charaxes cithaeron joanae ssp. n.

(Pl. 20, figs. 140–145)

The species *cithaeron* does not appear to have been recorded from the western half of Northern Rhodesia until recently, when a single male was captured and forwarded to me by Mrs. J. Wedekind of Mumbwa. Mumbwa is situated west of Lusaka in the bend of the Kafue River. The country thereabouts is largely savanna with small patches of riverine or gallery forest.

The specimen aroused my interest for it appeared to differ considerably from other known races of the species and I urged my correspondent to try and obtain further material including females ; at the same time I drew Dr. Cottrell's attention to the capture.

The species does not appear to be common in the area, but the result of the combined efforts of these two collectors has been the taking of a dozen males and females over a period of almost two years ; they substantiate the distinctness of this race.

The male differs from the nominotypical Natal race by the larger spots of the fore wing both discal and postdiscal, by the larger more conspicuous marginal spots ; by the larger hind wing discal patch, larger submarginal spots and more conspicuous marginal lunules. The female differs in the fore wing by its wider more solid discal band, larger sub-apical white spots, more conspicuous marginal ochreous spots, and in the hind wing by the considerably larger discal patch, larger blue submarginal spots and broader marginal ochreous border.

Male. Fore wing length 38–45 mm. (Mumbwa specimens March–April average large, 45 mm. Chisamba, Lusaka area July, 45 mm., October–November, 38–43 mm. This difference in size combined with differing underside characters may be seasonal.) *Upperside.* Fore wing ground colour strongly blue-black with strong greeny-blue sheen at base ; discal spots arranged as in nominotypical *cithaeron* but always considerably larger, those in 1b usually large and may be fused with the elongate blue streak in 1a and usually touching the large post-discal spot in 1b ; post-discal spots larger and well marked, subapical white spots larger, other spots blue ; marginal spots well developed, white or creamy. Hind wing basal areas black, distal border blue-black ; discal patch constantly wider than nominotypical specimens and strongly suffused with bright blue in upper and outer borders, whitish towards inner fold which is greyish to greyish-white ; the patch is represented at the costa by a white or bluish-white spot. Most specimens exhibit a series of white or ochreous-tinted spots on upper portion of outer border of the discal patch or along the entire border to just above the anal angle ; black border with well developed blue arrow-head marks, white centred ; marginal lunules orange-ochre separated by ends of black veins ; tails relatively short, upper 4–5 mm., lower 3–4 mm. *Underside.* Much duller and lighter (almost uniform ochreous putty-coloured in dry season specimens), less strongly patterned than in Natal specimens, the black lines finer ; the fore wing tornal occular spot smaller and almost or completely divided into two ; the post-discal dark line in hind wing is, however, more apparent against the paler ground.

Female. Fore wing length 47–52 mm., majority 50 mm. (There is some seasonal size variation as noted in the males.) The outstanding character of this race is the very wide, solid fore wing white band, and the large discal patch in hind wing. *Upperside.* Ground colour less blackish, the basal areas more brownish (fading to olive-brown in old specimens). Fore wing pattern much as in the nominate race but bolder, the discal curved bar uniformly wider throughout its length, the inner edge being less indented in area 3 due to spot there, being large and its base less set-out ; the three elongate marks beyond the cell longer and very frequently with a white streak subcostal in the cell ; white scaling on costa more extended ; the lower white blocks in 1a–3 often with white scaling along the veins proximally, giving the inner border a " rayed " appearance ; post-discal series of spots often entire, the two subapical ones large, the upper one arrow-head in shape, the lower more rounded or oval, the remainder whitish or slightly tinted ochre, that in 2 contiguous with the discal mark ; discal bar in 1a–2 extends much nearer the tornus than in the nominate race ; marginal spots clearly indicated, often large, double in 1b, slightly ochreous. Hind wing discal patch very large, extending from the costa to the anal angle and on the inner border merging with the greyish of the inner fold ; inner border almost straight but diffuse, with a defined indentation at the costal spot, outer border more curved, with evidence of post-discal spots in 7–5, the upper one free, the others merging into the border of the patch ; centre of patch whitish but margins suffused with violet-blue to mauve scaling. The large size of the patch reduces the width of the outer black border which carries submarginal blue spots, large and well developed and in continuous series from upper angle to anal angle. Marginal lunules well marked, ochreous or creamy ; margin moderately dentate, and white fringe obvious ; tails thick at base, more robust than in Natal specimens ; length, upper 6–8 mm., lower 4–7 mm. *Underside.* There appears to be some seasonal variation in colour and markings : specimens taken during March–April at Mumbwa are boldly lined, those captured during August–November are very pale and lightly marked.

Discal white bar of upperside here reproduced and extending to the hind margin ; post-discal spots rather diffuse ; dark tornal spot less marked and almost divided and reduced in size. Hind wing ground colour paler than nominate race, dark lines almost obscured, but post-discal ochreous marks with dusky distal scaling more obvious, but the marginal lunules may be obscured.

Holotype male. RHODESIA : Mumbwa, west of Lusaka, 15.xii.1961 (*Mrs. J. Wedekind*), after whom this race is named. British Museum (N.H.).

Allotype female. Same locality, iv.1962 (*Mrs. J. Wedekind*).

Paratypes : Mumbwa and Lusaka in Coll. B.M. and Coll. Cottrell, taken by Mrs. Wedekind and C. B. Cottrell.

Range : All material taken so far has come from the Mumbwa-Lusaka area in the region of the Kafue bend in the western block of N. Rhodesia. It may extend eastward and northward, in suitable localities. At present there appears to be complete separation from the Nyasaland race.

Charaxes cithaeron nyasae ssp. n.

(Pl. 21, figs. 147–149 ; Pl. 22, figs. 153–156 ; Pl. 23, figs. 161–163)

The general facies of this race bears some resemblance, especially in the females, to the race *joanae* of western Rhodesia. The females are, in the main, broad banded. The males exhibit a larger hind wing patch than in the Natal race and they are a brighter insect of comparatively large size.

The male differs from the nominotypical race and from *joanae* by its brighter blue sheen especially on the forewings, the spots being larger than those of the Natal race but not so large as in *joanae*, and these spots having a more greeny-blue tone, especially on hind margin. The hind wing discal patch is larger than those of the Natal race, slightly smaller than in *joanae* but with a strong greeny-blue border on upper and outer sides and the marginal ochreous border conspicuous. The female is larger than Natal specimens as a rule ; the ground colour not so dark, the fore wing discal band wider, more solid but not so wide as in *joanae* ; the post-discal spots larger and more complete ; the marginal ochreous spots present but small ; hind wing discal patch large, shaded with lavender and with irregular outer border with post-discal spots visible ; the submarginal spots large, marginal ochreous border conspicuous ; the tails long.

MALE. Fore wing length 43–48 mm., majority 45 mm. *Upperside.* Ground colour a brighter blue-black than typical Natal specimens, with a strong tinge of green sheen in basal area. The blue spots are, on an average, larger than in nominotypical *cithaeron*, but not as large as in *joanae*. The discal spots of fore wing are complete from costa to hind margin ; post-discal spots well developed and the line more inclined proximad in area 3 giving the line a distinct inward kink ; also the margin more concave ; two upper subapical spots white, remainder blue-green and in a majority of specimens discal and post-discal spots approximate or fused in 1b ; margin of the wing with small but distinct creamy spots, occasionally these spots are as large as in *joanae*. Hind wing basal area black, inner fold ashy-grey ; the dark border with greeny-blue sheen ; discal patch comparatively large but does not extend towards costa so much as in *joanae*, but is represented by one discrete spot at costa and by one or two discrete post-discal spots ; upper and outer borders of the patch with strong greeny-blue

suffusion, brighter than Natal specimens and this brightness is retained even in old specimens taken in 1928 ; black border with a complete series of submarginal blue spots, usually large, but sometimes small ; marginal lunules sometimes complete or usually divided by internervular rays, ochreous with some greeny scaling in the region of the tails and at anal angle ; tails thin and longer than in *joanae*, upper 6–7 mm., lower 4–5 mm. *Underside.* Ground colour colder darker grey, less brownish than Natal race, and much darker than the dry season form of *joanae* ; pattern as in nominotypical *cithaeron*, but post-discal row of fore wing spots slightly more kinked proximad as on upperside.

Female. Fore wing length 47–51 mm., mostly 50 mm. *Upperside.* As already stated, these females bear a resemblance to female *joanae* in that the fore wing is wide and the hind wing patch large. Fore wing discal white band less indented on the inner margin than Natal race, due to the larger marks in 1b which extend proximad, and the frequent white scaling at end of cell ; streak in 1a suffused with blue as is proximal end of mark in 1b, the conjoined marks here, being solid and hardly if at all indented on the distal end ; post-discal spots well developed, the supapical ones large and white, the remainder suffused with bluish and often present in 2 or even 1b. Hind wing as in *joanae* ; discal patch large, extending up to the costa in discal row and often with a post-discal series of spots, free in subcostal area but merging into outer border of patch giving it a rayed or dentate outline, thus not so defined as in *joanae*, outer border strongly suffused with lavender-blue scaling ; dark distal border though relatively narrow is ill defined on its inner edge and carries a complete row of large lavender-blue white centred spots, these more bluish at anal angle ; marginal lunules creamy or ochreous, usually divided at mid point and separated by ends of dark veins ; white fringe strongly marked in most specimens ; tails moderate in length, upper 6–9 mm., lower 5–7 mm., mostly black, upper one with ochreous mid line. *Underside.* Ground colour as male but pattern bolder as a rule but variable ; discal and post-discal marks bold in fore wing, the former continued to hind margin. Hind wing discal and post-discal lines and spots bold, but may be suppressed on discal line. This variation may be seasonal.

Variations. Although the vast majority of specimens exhibit a marked degree of constancy in pattern, one or two specimens of both sexes show a departure from the rule. Thus one male (Pl. 21, fig. 149) exhibits a reduction in the size of the fore wing spots and an accompanying restriction of the hind wing patch. Two other males (Pl. 22, figs. 153, 154) exhibit a fore wing pattern within the normal range but the hind wing patches are narrow and unusual and the undersides are abnormal. Females (Pl. 22, figs. 155, 156), with a reduction in the fore wing and hind wing spots and discal patch suggest a trend toward the southern nominotypical race.

Holotype male. Nyasaland : W. shore Lake Nyasa at Nkata Bay, 1,800 ft., 4.iv.1958 (*J. D. Handman*). British Museum (N.H.).

Allotype female. Same locality, 2.v.1962 (*J. D. Handman*). British Museum (N.H.).

Paratypes : Nkata Bay; Mlaye and Mlosa Stream foothills Mlanje ; also at Monkey Bay.

ab. ***griseus*** Schultze

(Pl. 21, fig. 146)

Charaxes cithaeron ab. *griseus* Schultze 1913a : 82.

Through the kindness of Dr. Hannemann, I have been able to examine the type specimen described by Schultze from Manow, southern highlands Tanganyika, north of Lake Nyasa.

Upperside. The specimen is normal in size and markings, but the ground colour of both fore and hind wings, instead of being blue-black is a curious semi-translucent brownish-black suggestive of a lack of development of melanin pigment in the scales. The *underside* ground colour is greyish-brown without olive shading ; the black lines are thin and the ochreous spots though present are not strongly indicated. The specimen is old, but the date of capture is not given on the data label. The tails are long and thin, upper 7 mm., lower 5 mm., thus considerably longer than in *Ch. xiphares brevicaudatus* Sch. which also occurs in the Manow area and which bears a superficial resemblance to *cithaeron*.

I have seen no other specimens from north of Lake Nyasa, but this specimen seems to fit in with *cithaeron nyasae* from Lake Nyasa, and is placed to this race.

Range : From the north-western shores of Lake Nyasa at Nkata Bay 1,800 ft. south to the region of Zomba and the foothills of Mlanje, and neighbourhood. I have no records of the species from the eastern shores of Lake Nyasa.

Charaxes cithaeron kennethi Poulton

(Pl. 22, figs. 157, 158 ; Pl. 23, figs. 164–168)

Charaxes cithaeron kennethi Poulton, 1926 : 539.

This subspecies was accepted as valid up to 1953 when Dr. van Son suggested that the nominotypical race extended " over the whole eastern coastal area from Pondoland to Kenya " and that *kennethi* was but a wide banded female form to be found in the southern areas of nominate *cithaeron*. I have already commented on the evidence he adduces in support of his views, in the introduction to this section, and would here add that Dr. van Son appears to have based his views mainly on the female, disregarding the male of the race.

Male. Fore wing length 44–47 mm., majority 46 mm. *Upperside.* Ground colour dark blue-black with just a slight or no green sheen at base; fore wing base of hind wing black, inner fold dark to light ashy-grey. Fore wing discal spots usually well marked, complete in series to 1b, but some variation in length of marks ; post-discal series generally larger than in Natal specimens ; white subapical spots larger ; spots in 1b usually free, but if large and angled may meet discal spot in same area ; marginal spots if present, small, double in 1b ; fringe white, interrupted by dark ends of veins. Hind wing discal patch white with blue suffusion on upper and outer borders, moderately wide and whiter than in nominotypical race, usually represented at subcosta by a white or bluish discal spot quite free ; on the upper and outerside by one or two post-discal bluish-white discrete spots ; distal black border with large submarginal angular blue spots with white centres, double at anal angle and brighter blue ; marginal ochreous line broken by a dark mid-line and separated by ends of dark veins ; fringe narrowly white ; tails long, upper 6–9 mm., lower 5–6 mm. seldom shorter. *Underside.* Ground colour slightly darker than Natal race, as a rule but pattern less strongly marked ; dark lines and ochre-olive shading less broad ; post-discal spots fore wing less marked.

Female. Fore wing length 47–51 mm., majority 50 mm. *Upperside.* Distal portions of wings black, proximal more brownish, fore wing discal bar slightly variable, but majority wider than in Natal specimens, the inner border of bar less indented and irregular due to the longer and larger marks in 1a–1b, the hind marginal blue streak shaded lavender-bluish and the inner portion of mark above in 1b also lavender, moreover the third mark beyond the cell is also more elongated ; post-discal spots in the subapex large and white and this series usually stops in 4, but may extend to 3 but in more diffuse form, most of the spots covered with dusky scaling ; margin of wing without light spots, but fringe narrowly white. Hind wing discal patch usually large, but not so large as in *nyasae* or *joanae*, but the average larger than Natal

specimens, the whole suffused with lavender scaling, the inner border extends to the costa where the mark is sharply defined proximad while the outer border is more dyslegnic and somewhat rayed with white scaling along the veins and one or two spots of the post-discal series may be present in 6–7 ; distal black border carries a series of triangular or elongate lavender-blue marks with white centres, double at anal angle and bluer ; marginal ochreous line usually present but strongly divided by black at mid-point and separated by ends of veins ; fringe narrowly white interrupted by dark veins ; margin slightly dentate ; tails long and slender, upper 9–10 mm., lower 7–8 mm., may be black or with narrow pale streak for entire length. In some specimens the submarginal spots are exceptionally small and obscured. *Underside.* Ground colour dark cold olive-grey or with a slight ochre-brown tinge ; discal white bar well marked ; post-discal spots obscured (except for two subapical) in the dark form, or more conspicuous when the ground colour is paler and the zigzag discal line in hind wing is more defined and the post-discal spots show up.

Variations. A contrasting rare variation in the female is figured (Pl. 23, fig. 167). Associated with this subspecies is material taken in the Newala district of southern area Tanganyika, north of the Ruvuma River. These specimens though not quite typical link up with material from Morogoro inland from Dar es Salaam on the central railway line (Pl. 23, figs. 164–168).

Range : This race, in typical form, ranges from the coastal belt of Kenya and Tanganyika north to the south Somali border at Milimani extending inland to Kibwezi, Voi and the Teita Hills and the Mutha district of Ukambani, to Makueni along the riverine forest patches. It also occurs in the foothills of Kilimanjaro at Moshi and Arusha and noted at Namanga. Specimens from Arusha and Manyara are less stable than typical coast material.

Charaxes cithaeron nairobicus van Son

(Pl. 21, figs. 150–152 ; Pl. 22, figs. 159, 160)

Charaxes cithaeron nairobicus van Son, 1953 : 220.

Male. Fore wing length 45–48 mm., majority 47–48 mm. *Upperside.* Fore wing ground colour very dark purply-blue-black or deep blue-black with a greenish sheen at base in side light ; hind wing black at base with some blue-green reflections on distal border ; fore wing discal blue spots large, strongly blue or with a purply sheen, the series in a distinct curve, as spots in 1b are set in basad and streak in 1b is large and extends inward well beyond spot in area above ; post-discal spots all well developed, the two subapical ones white, the remainder blue, the two marks in 1b approximating on inner edge and forming a cordate or arrow-head mark ; marginal ochreous or creamy spots well developed, often elongate-quadrate, separated by the dark veins ; tornus with double spot. Hind wing discal patch large, whitish towards inner fold but strongly suffused with blue on upper and outer borders, represented on subcosta by a large diffuse bluish spot and in the post-discal line by a distinct subcostal spot followed by a larger one in area below, these two spots free or occasionally suffused over with blue scales, very often these spots and those within the outer border of patch have a strong ochreous tint which shows up clearly ; submarginal spots usually large and somewhat angular, the bright double spot at anal angle often conjoined ; margin usually broadly ochreous divided by the dark veins giving the edge of the wing a dentate appearance ; fringe narrowly white ; tails robust and short, upper 4–7 mm., lower 3–5 mm. largely ochreous with only a narrow black edge. *Underside.* Slightly variable but ground colour usually dark olive-greyish with a tawny bloom, but it may be generally dark olive-grey in which case the white lines and ochreous spots show up conspicuously. In the paler form the hind wing pattern is largely obscured especially in the discal and post-discal areas and along the submargin, but the ochreous marginal border is broad and conspicuous.

FEMALE. Fore wing length somewhat variable, denoting season and food plant ; in a dry season resultant specimens are stunted. In a very long series the wing length varies from 46–54 mm., but the large majority are 50 mm. There is a similar variation in the upperside pattern in respect to the width of the fore wing discal white bar and the development of the post-discal spots ; in the hind wing in the size of the discal patch and the sub-marginal blue spots. However, the overall characters of the Kenya highland race hold good. It is a large race and in both sexes the pattern is bold, particularly in the hind wing discal patch which not infrequently has a tinge of ochreous in the upper and outer borders corresponding to the position of the incorporated post-discal spots. The submarginal row of blue spots with white centres is usually strong and the margin is boldly ochreous. *Underside.* Exhibits some variation in ground colour being either dark olive-grey with bold lines and ochreous shading and the zigzag line through the disc of hind wing well developed often forming a conspicuous bar. In specimens with paler ground colour the pattern is finer and the ochreous suffusion results in suppression of a strong pattern. Some of these variations are shown on Pl. 21, figs. 150–152.

Range : The forests of the Kenya Highlands east of the Rift Valley, the Aberdares and Mt. Kenya, the upper Kikuyu forests and in the drier forests around Nairobi-Ngong where the species is plentiful. It also occurs in the riverine and gallery forests extending southward into Ukambani where there is some evidence that it may make contact with the subspecies *kennethi*.

SYSTEMATIC LIST

Charaxes cithaeron Felder

Charaxes cithaeron cithaeron Felder, 1859. Type locality : Natal. Range : from Pondoland S.E. Cape Colony to Beira and Dondo (perhaps beyond) in Mozambique, extending inland to the eastern flank of S. Rhodesia.

joanae ssp. n. Type locality : Mumbwa, western area N. Rhodesia. Range : at present known only from the Mumbwa-Lusaka area within the Kafue Loop, associated with areas of savanna and riverine forest.

nyasae ssp. n. Type locality : Nkata Bay, west shore Lake Nyasa. Range : all material so far examined comes from the western shore of Lake Nyasa from Nkata Bay then southwards to Cholo, Zomba, and the foothills of Mlanje. It may range into the adjoining eastern side of Lake Nyasa in Mozambique, but not north of the Ruvumba River.

ab. *griseus* Schultze. Type locality : Manow, north of Lake Nyasa.

kennethi Poulton, 1926. Type locality : Mombasa, Kenya Coast. Range : the forests and woodlands along the Kenya coast from Milimani north of Witu, south to the Usambara range in Tanganyika then to Morogoro and the Lindi area, north of the Ruvuma River. In Kenya, it extends inland along the Tana-Sabaki Rivers to Voi and Kibwezi, the Teita Hills and the foothills of Kilimanjaro, Moshi and Arusha.